

MEN AT WORK

Books by Stuart Chase

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MEN AT WORK

MEN AT WORK

Some Democratic Methods for the Power Age

by

STUART CHASE

in collaboration with

MARIAN TYLER CHASE



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first edition



A WARTIME BOOK

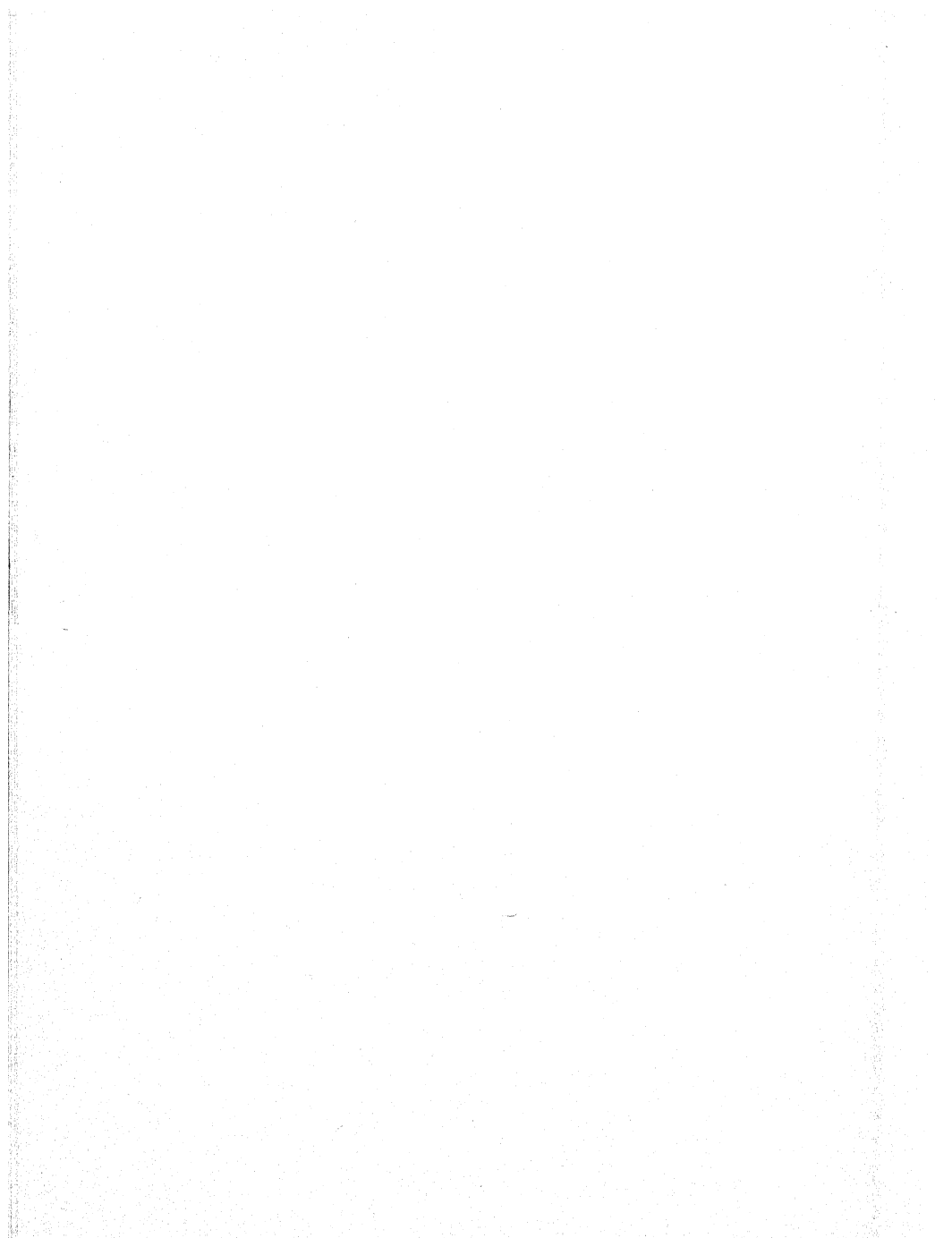
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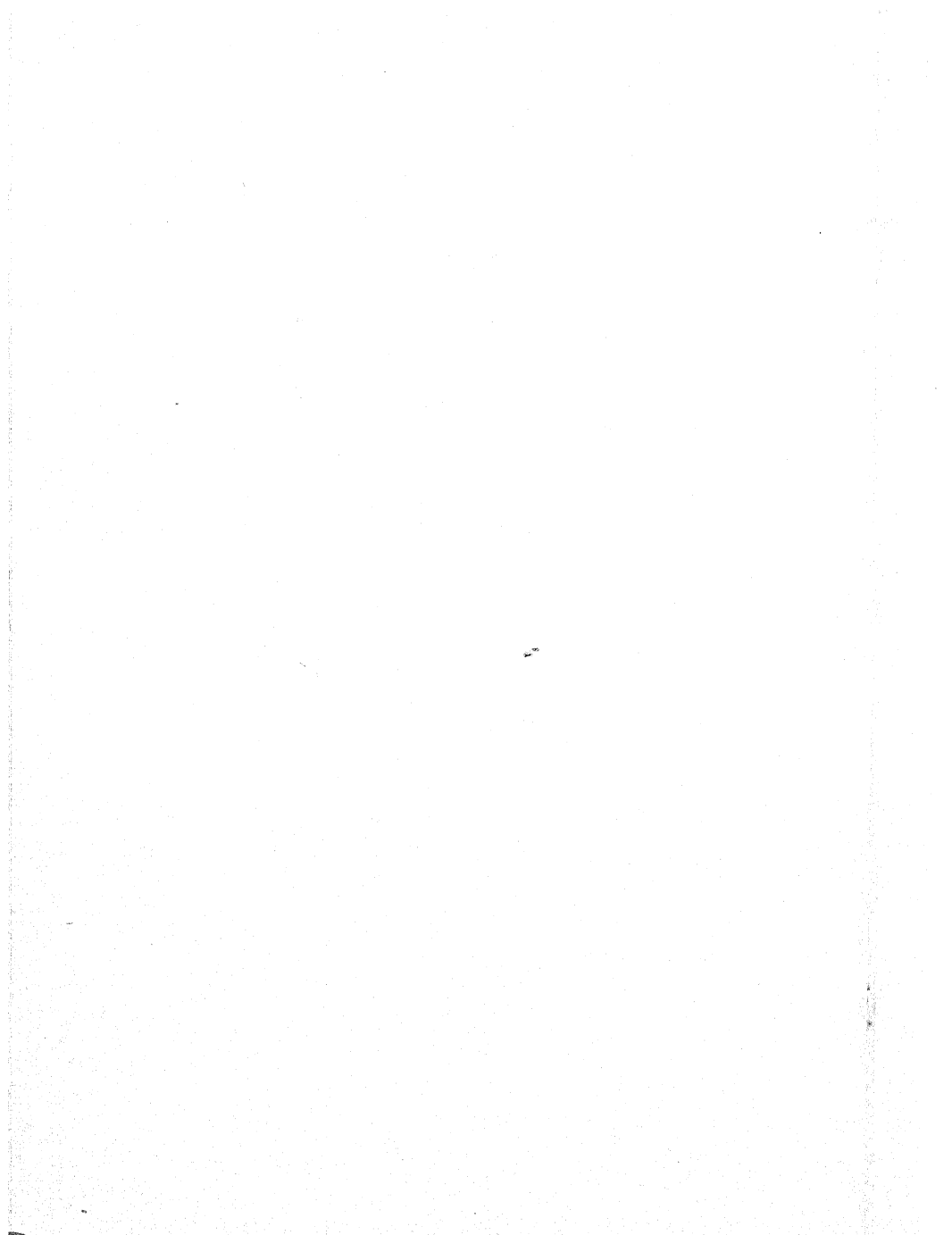
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CONTENTS

1. FITTING THE POWER AGE TO MAN	3
2. WHY MEN WORK <i>The Hawthorne Studies</i>	9
3. A BIGGER PIE <i>Report on Labor-Management Committees</i>	28
4. EDUCATING THE BOSS <i>The Job Relations Program of the TWI</i>	40
5. SHOW-HOW <i>The Job Instruction Program</i>	56
6. TO DO IT EASIER AND DO IT BETTER <i>The Job Management Program</i>	66
7. SOME BUREAUCRATS ARE HUMAN <i>The Social Security Board in Wartime</i>	77
8. TEAMS, GROUPS, AND GANGS <i>A New Dimension for Democracy?</i>	89
9. FROM THE LOWER DEPTHS <i>The Story of One Hundred Sharecroppers</i>	105
10. HOW TO KEEP GHOSTS OUT OF TOWN <i>A Plan for Elma, Washington</i>	119
11. WHAT THE TVA MEANS <i>Planning at the Grass-Roots</i>	134

MEN AT WORK



1

FITTING THE POWER AGE TO MAN

I do quite a little puttering around my place in Connecticut. Some of it is essential to the maintenance of the place, like shoveling snow and getting in the firewood. Some of it is for exercise and amusement, like cutting ski trails—which, however, also serve as fire lines. Some of it is devoted to conservation and posterity, like tending 1,000 little spruces and 500 little pines.

These handicraft tasks I perform when I tire of desk work, or when the sun is right and the weather feels good. I do them at my leisure, to a rhythm of my own setting. When the bucksaw palls, I change to the ax. When mowing tires my arms, I take up the big pruner or the pitchfork. In this way I keep continually alert and interested. If I had to work to a stop watch or an assembly line, I should first be frustrated, then angry; and then I should probably lose my mind. On the back hill I set the pace. In a factory an impersonal outside mechanism often sets the pace.

Men at Work

I used to feel a little guilty because of my freedom. This was not the proper way to get work done. The proper way was to get up very early, go on a train or a subway, punch a time clock, and never rest when one felt like resting.

Then one day in a book by Barbara Wootton called *Lament for Economics* I stumbled on this line: “. . . the sharp regular daily division between work and play—a condition that must have been virtually unknown throughout the long ages of pre-factory history.”

It was one of those revealing phrases that make the parts of a puzzle fall into place. So my work was play and my play was work, out on the back hill. I was apparently a pure pre-machine man, carrying on the way my forefathers had carried on for 100,000 years, more or less. My nervous system was adapted to the work-play, suit-your-own-tempo pattern. It was not adapted to a time clock or an assembly line pattern.

Whose nervous system is? A conveyor belt can deprive the worker of all control over the pace of his work. How far do slick technical improvements defeat their own ends by frustrating the worker's deepest psychological drives? Is there any way that factories can be rearranged to satisfy those drives? Can we inject into power age tasks some of the independent tempo and self-direction of the timeless handicraft pattern?

Which brings us to the point of this book. Every story in it is about men in the toils of machines, or in conditions that machines have created. All indicate progress in saving the individual spirit from being overwhelmed. All are attempts to answer the question: How can we accept the power age and remain human?

Two separate conditions are involved. *First*, the ma-

Power Age

chine process directly threatens the individual, as when human robots are created by stop-watch methods, by monotonous, repetitive tasks, by the belt or its equivalent.

Second, the power age cannot operate without some overhead social controls, of which the most obvious example is traffic signals on the highways. Even to enforce free competition under modern conditions requires vast centralized efforts by the anti-monopoly squads of the Department of Justice. Planning is now mandatory for such essentials as social security, public health, education, transportation, communication, conservation, power, foreign trade and investment—to say nothing of military outlays and war.

The individual cannot long survive by his own unaided efforts. It is all very well for me to swing a happy scythe up there on the hill, but when I get back home most of the food I eat comes by train and truck a thousand miles and more. Somebody must make it his business to see that the food trains get through. As civilization grows more complex, the controlled area tends to expand.

This trend can lead into a highly centralized system of rigid rules and orders, as in the case of the totalitarian powers, which is rightly seen as a calamity for the individual spirit. But attempts to escape it by denying the trend and striking off all controls, open the way to greater calamities. It is not misguided men who fasten these controls upon us; it is the imperatives of the power age. Do you remember how you felt as the banks began to close in 1933? Did anyone will this gathering calamity? Of course not. The productivity of the machine had got ahead of effective purchasing power. No adequate control had been applied.

Men at Work

Plan, or retreat to a handicraft culture, like that of pre-war India or China. To my mind the choice is as simple as that.

Yet the controls can be, and often have been, dictatorial and harsh on the human spirit. Is there any way to combine planning with democracy?

SPECIFIC CASES

This book is concerned almost exclusively with the two conditions stated above: the conflict of the individual with the factory, and his conflict with a planned society. It is a book of concrete examples. I think it wiser to go to the facts than to argue interminably about Man vs. the Machine, or the Individual vs. the State.

In any program for manufacturing goods by mass production, for introducing new methods, for developing a community or a region, the interest of the individual should be carefully safeguarded. How can this be done? We will present a variety of ways and means already in operation, some of them in very extensive operation. In the Training Within Industry programs more than a million foremen have already participated.

Of these ways and means, some were developed before the war; others were stimulated by the pressures of war. We value manpower now that it is scarce, value it even more while it is being wasted so prodigally on the battlefronts. There is danger that it may grow cheap again after demobilization day. It is accordingly important to describe, identify, and pin down the new methods.

As you will see, these methods are not emergency rations, but long-term programs. They deal with the adap-

Power Age

tation of the power age to man—not *vice versa*. Man comes first. To some observers, this is the greatest long-term problem of our time. The Germans' V-2 weapon is one aspect of it—though not here discussed. How do we adapt V-2 to man? Obviously, there is only one way: we abolish V-2.

Five of the chapters which follow deal with work in factories, four of them war factories. The Hawthorne experiments were carried on between 1924 and 1940—in times of peace. It is interesting to note, however, that these experiments were a direct result of fatigue studies in the munitions plants of the last war.

Three of the chapters deal with economic planning and how to make it more democratic. One is concerned with a great watershed, the TVA region; one with a town in a western state, whose resource base was threatened, one with a small community of a hundred share-cropper families in Missouri. The last is perhaps one of the most impressive experiments in fundamental democracy ever made.

There is a chapter on humanizing office work in a vast government bureau, the Social Security Board. Finally, there is a chapter on that curious human phenomenon, probably as ancient and deep-seated as my outdoor work habits, the team spirit or gang spirit. Indeed, we find the team spirit cropping out constantly in other chapters. Clearly there is something here of great vitality, and very little understood.

What these studies chiefly have in common is a certain natural respect for the rank and file. There is no charity and little conscious benevolence reported anywhere in these pages. The experiments we shall record assume to begin with that people are important. When that feeling

Men at Work

is sincere and is communicated to the individual, his output curve goes through the roof! This happens time and again, as you shall see, and it indicates that a vast, dynamic source of energy has been overlooked in traditional ways of managing people.

We shall also observe the rise of the individual in competence and power as he takes responsibility. On the assumption that workers are dumb oxen to be driven, innate ability is smothered. On the assumption that people are important, abilities have an opportunity to flower, to the great advantage of the individual worker, the management, the output.

Again, if collective controls are necessary and are going to work permanently, it seems to be essential to let the rank and file participate in their formulation. In that way one enormous difficulty of planning is by-passed, because people will discipline themselves. The plan is *their* plan; they have helped to make it. This approach to planning is not widely held or accepted. It needs more study, more refining, more experiment. But a stimulating beginning has been made, especially in the TVA.

David Lilienthal, in *Democracy on the March*, puts it this way:

Methods can be developed—methods I have described as grass-roots democracy—which do create an opportunity for greater happiness and deeper experience, for freedom, in the very course of technical progress. . . . Far from forcing the surrender of individual freedom and the things of the spirit to the machine, the machine can be made to promote those very ends.

2

WHY MEN WORK

The Hawthorne Studies

I NEVER pick up a telephone receiver without being reminded of the most important study of people working in factories ever made. Telephones are mostly manufactured by the Western Electric Company. The study was made in that company's plant at Hawthorne, just south of Chicago. It was carried on over a period of sixteen years, from 1924 to 1940, and it cost a million dollars—though that is the least important thing about it. If managers of factories the country over were intimately aware of what the research men at Hawthorne discovered, American industry would be revolutionized.

For centuries it was thought that the more hours men worked the more goods they would produce. It was plain common sense that in a twelve-hour day they would turn out twice as much as in a six-hour day. The last world war upset this concept. It was found that women making munitions in Britain turned out more shells in eight hours than they did in ten. Although this seemed contrary to

Men at Work

common sense, it had a sound reason behind it. Toward the end of a ten-hour day the workers became so tired that their output dropped way down, while accidents and spoilage went way up. The human machine is not made of tireless steel. So a new concept of fatigue as setting limits to output was adopted by progressive managers everywhere after the war. Experts tried to find for each industry that number of hours where daily output was at a maximum.

Now came the Hawthorne experiments to register another shattering change in concepts about factory work. Under certain conditions, which we will presently explore, workers produced more if their hours were shortened and more if their hours were lengthened! Something was discovered which was far more important than hours or wages or physical conditions. Something was discovered which, when applied, *increased output no matter what you did about physical conditions!*

This mysterious something is hidden deep in human nature. The fatigue experts did not find it. The stopwatch boys have completely overlooked it. All decent managers of factories have known intuitively that it was there, but they have not known what it was.

Consider what has happened since the industrial revolution began about two hundred years ago. The factory has taken a biological specimen, inheriting a million years of free outdoor life, living away in clans and groups with an elaborate ritual, and forced it into a totally new environment. This biological specimen must now make repetitive motions with its hands and body in a huge, bleak, noisy wigwam, with bells, whistles, and clocks governing its motions. Danger man had known, and hunger, massacre,

The Hawthorne Studies

and war. But never anything like this. No tribe from the North Cape to Patagonia ever knew anything like this. The machine age has built a cage of concrete and steel and put man in it, like an animal in a zoo. Some animals thrive in zoos. Some die.

We say that factory workers are restless, go on strike, sometimes become violent. This we call the "labor problem," and urge that labor and capital get together. Suppose it is not so simple as that? Suppose it is all one big zoo, with workers in one cage and managers in another? We say that if wages were higher, hours shorter, the lighting better, or unions abolished, or agitators sent back where they came from, then everything would be all right. Suppose these things are done and it still is not all right? Suppose the only way to keep people from being unhappy in cages is to let them out?

THE RESEARCH STAFF

The Western Electric Company had the courage to attack this question head on. It has, in peacetime, 30,000 workers in the Hawthorne plant, representing sixty nationalities. It is a progressive company with the latest schemes for pensions, sickness, and accident benefits, safety councils, recreation clubs, thrift plans. Strikes and "labor troubles" are at a minimum and have been so for many years. Yet this benevolent and progressive company, as we shall see, was rife with tension and frustration in the prosperous 1920's. Its managers had little information about how to manage the 30,000 human beings in their care.

In 1924 Western Electric in co-operation with the Na-

Men at Work

tional Academy of Sciences undertook a study into the effects of lighting on work. The results appeared so contradictory that the research was pushed into one phase of working conditions after another. Mr. G. A. Pennock was in general charge. Associated with him were various experts from the Harvard Business School, the Medical School, the Department of Anthropology, and the Harvard Fatigue Laboratory. Dr. Elton Mayo and Professor T. N. Whitehead have written books covering certain aspects of the work. The Rockefeller Foundation has contributed funds to Harvard for the purpose of following and checking the Hawthorne studies. Professor Clair E. Turner of the Massachusetts Institute of Technology has collaborated. The most impressive account of the whole development is to be found in *Management and the Worker*, by Professor F. J. Roethlisberger of Harvard, and William J. Dickson of the Western Electric research staff, published by the Harvard University Press in 1940, a book which the *Personnel Journal* called the most outstanding study of industrial relations that has ever been published anywhere. The whole project, you see, has been carried on in close co-operation with universities and foundations, and is not a "company job."

A factory, says the research staff, may be regarded as performing two major functions: producing goods, and creating and distributing human satisfactions among the people under its roof. The first function is economic, the second social. A great deal of study has been devoted to the former by engineers, accountants, efficiency experts. The literature would fill a library. Very little study had been devoted to the social function, the "creating and distributing of human satisfactions," until the Hawthorne

The Hawthorne Studies

experiment came along. Curiously enough, the investigators started out with the first function and ended up with the second. They found that the two functions were so closely connected that they could not be separated without violence to the facts. If the human organization of the factory is out of balance, all the efficiency systems in the world will not improve the output of goods. The major task of management is to link these two functions, to get output in line with the human, social life of the factory.

The research staff concluded that the whole philosophy of management in the machine age needs to be reformulated on this basis. Labor unions do not solve the problem. Efficiency studies do not solve it. Benevolence does not solve it. It is solvable only by *understanding* how human beings feel about their work, and about the social and group circumstances under which they work. Example: It was found that employees at Hawthorne were more concerned about their wages in relation to wages of fellow workers, than about the absolute amount. Even if their wages were high, they were burned up if somebody whose position in the company they considered inferior, received more. Thus they cared more about how they fitted into the *group* organization than about the cash they got.

MORE OR LESS LIGHT

The investigation began with lighting. It was generally assumed that the better the light the greater would be the output. How much greater? A careful technique was devised to measure this. Workers winding induction coils were chosen for the experiment and divided into two groups. The "control group" worked under a constant

Men at Work

amount of light. The "test group" received variable amounts. The output of both groups was carefully measured. It all looked very scientific. Now watch the props being knocked out from under the original assumptions!

The test group is given increased light. Its output goes up. Good; that was to be expected. But the output of the control group—without a candle power of extra light—goes up too! This was *not* expected. It is contrary to common sense—indeed, it is completely screwy. But screwier results are to follow. Light for the test group is now decreased below that of the control group. Its output goes up again! So does that of the control group! What in heaven's name is going on?

The research staff was forced to conclude that intensity of light was a minor factor in producing induction coils, where the motions of the workers are largely automatic. To verify this they put two workers in a locker room with no light at all except what came through a crack under the door. The workers maintained output, even in the dark.

The reason for this result, so contrary to the doctrines of scientific management and common sense, was there, plain to see; but the investigators had not yet gone far enough to see it. Groping for an answer, they planned a new and more ambitious experiment. In this test a group of employees were subjected to changes in hours of work, in rest pauses, rates of pay, types of supervision; and their output was measured before and after the changes. Besides the fundamental question of what makes workers work, the investigators hoped to find answers to six other questions: Do employees on a forty-eight-hour week really get tired out physically? Are rest pauses desirable? Is a shorter

The Hawthorne Studies

work day desirable? What is the effect of changing the type of working equipment? Why does production fall off in the afternoon? What is the attitude of the workers toward their work and toward the company?

THE TEST ROOM

It was decided to use a group of girls assembling telephone relays. A telephone relay is a small gadget, looking something like a pocket whistle, made up of thirty-five separate parts. The task of the girls was to take these parts out of trays and put them together. It was a typical machine-age repetitive job.

Two girls were selected who were skilled at assembling relays, and they picked four companions. Five of the group were about twenty years old, three of Polish families, one of Italian, one of Czech. The sixth had been born in Norway, and was about thirty years old. They were all moved into a special room separated by a thin partition from the big relay department where 100 employees worked.

Here the six girls sit, at one long bench, trays of tiny metal parts in front of them. Their nimble fingers fly. Every minute or so a relay is finished, dropped into a chute, and carried out into a box on the floor, where it is collected. On each girl's chute is placed a little machine operating a kind of ticker tape which counts every relay coming through. For five years these tickers will click—from 1927 to 1932—giving an accurate record of hourly, daily, weekly output.

Five of the girls were assemblers, while the sixth was the "layout operator," who prepared the trays of parts

Men at Work

so the girls could assemble them more easily. A seventh person was also in the room—the observer. He represented the research staff. His job was to record everything of significance that happened. He was to be the counselor and friend of the girls, telling them about the experiment, talking over proposed changes, inviting their comments, listening to their complaints.

The idea was to let the girls work along as they had been doing in the regular department, and count the relays coming down the chute. This would give a base rate of output. Then, following the plan, shift the payment for a few weeks, and count the relays. Then introduce rest pauses of various kinds, and count the relays. Then vary the hours in the working day, give Saturday off and what not, and count the relays. If more relays per week went through the tickers, the change of course would be proved a good one and could be extended over the plant. If fewer relays went through the ticker, the change was obviously bad, and should not be adopted. It was all as clear as A B C.

If the investigators had been disturbed by what happened in the lighting experiments, they were knocked galley west by what happened to these six girls with flying fingers in the relay room. Things didn't happen the way they were expected to happen. Assumptions as to cause and effect were found to be completely false. As the weeks grew into months and years, the mystery became deeper and deeper. What was the matter with these girls? Why didn't they do what the efficiency books said they ought to do?

Being true scientists, however, the investigators kept

The Hawthorne Studies

doggedly on, recording faithfully what happened, even if they did not know what caused it or what it meant.

Here in brief outline is the mystery story, divided into chapters:

Periods 1 and 2, lasting seven weeks. These periods were devoted to getting the base output figures. The girls were found to average about 2,400 relays a week each. They worked the regular forty-eight hours, including Saturdays.

Period 3, lasting eight weeks. A variation in wages was introduced, putting the girls on a group piecework basis. Output went up.

Period 4, lasting five weeks. Two rest pauses of five minutes each were introduced, at ten in the morning and at two in the afternoon. Output went up.

Period 5, lasting four weeks. The rest pauses were increased to ten minutes each. Output went up sharply.

Period 6, lasting four weeks. Six five-minute rest pauses were tried. The girls complained that the rhythm of their work was broken. Output fell off slightly.

Period 7, lasting eleven weeks. Rest pauses were reduced to two, one of fifteen minutes in the morning, with a hot snack provided by the company, and one of ten minutes in the afternoon. Output went up.

Period 8, lasting seven weeks. The same conditions as *Period 7*, except that the girls were dismissed at four-thirty instead of five o'clock. Output went up sharply.

Period 9, lasting four weeks. The same as *Period 7*, except that closing time was moved to four o'clock. Output remained on a level.

Period 10, lasting twelve weeks. Back to the exact conditions of *Period 7*, with closing time at five o'clock. Were

Men at Work

the girls discouraged by losing an hour a day of liberty? They were not; output went up with a rush!

The research staff began to tear their hair. Their assumptions were disintegrating. Some unmeasured force was constantly pulling output up no matter how they juggled hours, wages, and rest pauses.

So after trying Saturdays off for twelve weeks, in *Period 11*, with output on a level, they prepared for the greatest test of all. They would throw the whole experiment back to where it started and *take away everything they had given the girls over a year and a half*. Surely this would crush their spirits and reduce the number of relays going through the counters. Surely every rule of common sense and factory management indicated that.

Period 12, lasting twelve weeks. The girls went back to the exact physical conditions of *Period 3*—no rest pauses, no company hot lunch, a full forty-eight-hour week. *Output jumped to an all-time high—3,000 relays a week, a cool 25 per cent above the original Period 3!*

THE UNKNOWN FACTOR

The staff swooned at their desks. They thought they were returning the girls to the original conditions of the experiment, but they found that the original conditions had gone forever. The experiment had changed under them, and the group they now had was not the group they had started with. Because of some mysterious X which had thrust itself into the experiment, this group of six girls was pouring 25 per cent more relays into the chutes, though working arrangements were precisely like those at the beginning of the test.

The Hawthorne Studies

What was this X? The research staff pulled themselves together and began looking for it. They conferred, argued, studied, and presently they found it. It wasn't in the physical production end of the factory at all. It was in the girls themselves. It was an *attitude*, the way the girls now felt about their work and their group. By segregating them into a little world of their own, by asking their help and co-operation, the investigators had given the young women a new sense of their own value. Their whole attitude changed from that of separate cogs in a machine to that of a congenial team helping the company solve a significant problem.

They had found stability, a place where they belonged, and work whose purpose they could clearly see. And so they worked faster and better than they ever had in their lives. The two functions of a factory had joined into one harmonious whole.

With this discovery, the results of the lighting experiments became clear. *Both* groups in the lighting test had come to feel important. So their output went up regardless of the candle power sprayed upon them.

The relay room showed other significant results. Cumulative fatigue was not present at any time, as proved by regular medical examination of the girls. They always worked well within their physical capacity. If monotony was present, it was blotted out in group interest, as the output curves bore witness.

It was found that each girl had a definite style in her work. She placed the parts *so* and assembled them *so*. Sometimes she put little frills on the job; the higher the IQ, the more frills. This helped to give her a real interest in the task. Beware, you stop-watch men, of destroying

Men at Work

little habits like this. You may run into the paradox of decreasing output by saving motions.

There was a visible increase in contentment, and an 80 per cent decrease in absenteeism. The girls were eager to come to work in the morning—a phenomenon as startling as a small boy eager to go to school. Early suspicions gave way to complete trust in the observer and in the integrity of the experiment. The girls came to feel that they had no boss. They moved about as they pleased, talked as they pleased. Nobody silenced them.

Two of the girls were talking together. Said one:

"The *fun* in the test room is what makes it worth while."

The other: "Yes, there are too many bosses in the department."

The first: "Yes, Mr. — (the observer) is the only boss we have."

The other: "Say, he's no boss. We don't have any boss."

With this sense of freedom came a sense of responsibility, and they began to discipline themselves. They evolved into a compact social unit, working as a team, helping each other, making up each other's work when one of the group was not feeling well, giving parties for one another outside the factory. They squabbled a bit, but underneath they were members of the same gang. They had found here some of the clan unity which the machine age has stripped away from so many industrial workers. They stayed in the factory, but they came out of the cage.

Human societies since Adam have depended on non-logical social rules expressed in folkways and ceremonials. In handicraft days each member of the community was assigned his place and function, and he took pride in that

The Hawthorne Studies

place and in his work. The factory system has broken down these ancient folkways and substituted an economic logic. It doesn't work out. It does not connect with human nature. It spreads a sense of defeat and frustration. The relay test room substituted a new set of rules for the set which had been lost. In that place, and with those girls, they worked. The girls were integrated, better balanced, and happier.

It must not be thought that the investigators concluded that hours, rates of pay, rest pauses, lighting, were without significance. At certain limits—say a seventy-two-hour week—they may become the most important factor there is. They concluded that when work was carried on well within those crucial limits, physical characteristics were less important than the human and social characteristics of the total situation. Feelings counted more than hours of labor. Rest pauses were a minor factor in contentment and output, but the experiment indicated that if there were not too many of them they had some beneficial effect. So they were extended throughout the plant, especially for women workers.

Another relay test group was set up to check the results of the first. A third group of girls, engaged in the fussy job of splitting sheets of mica, were put in a test room and studied for nearly two years, in 1929 and 1930. Both experiments tended to confirm the original results, but both were distorted toward the end by the spreading terror of the depression.

One girl in the mica-splitting room was having trouble at home. Her mother scolded her constantly and demanded her wages. The mother, an Austrian, was trying to save up enough money to go back to Vienna. That left

Men at Work

the girl without a country. She liked America, but she didn't know where to find it. She told the observer about her difficulties. The confession relieved her mind, and her output increased. Finally, a crisis arrived at home. She left the house and went to live with a girl friend. Her output reached an all-time high. This girl had found in the factory a social life which she could not find at home. Her adjustment was registered in her rate of work. Cases like hers are all too frequent. Thousands of people, especially foreign-born workers living apart from the American stream, have little social life. They try to establish it in the factory—but often with a pathetic lack of success.

21,000 INTERVIEWS

The test rooms had demonstrated that workers' attitudes had far more effect upon output than had physical changes. The research staff had discovered gold and felt they must push on. What could they do in a bigger way? They did something very big indeed. They resolved to tackle 21,000 employees in a huge experiment. This army could not be put in test rooms, but it could be interviewed, with the story of each employee carefully recorded. Interviewing had been an important part of the test room technique. It was a bold project—to ask in all honesty and confidence what 21,000 workers had to kick about, what they thought of their jobs, their working conditions, their bosses, and their company!

Men interviewed men; women interviewed women. The staff began with a prepared set of questions. If the employee wandered from the subject he was promptly brought back. But time and again he would wander off to

The Hawthorne Studies

the same topic. What was wrong? The staff went into conference and threw away the prepared questions. If the worker wandered, it was clearly because he had something more important on his mind. It might seem trivial to other people, but it was important to him. It was therefore precisely the thing which the interviewer should know.

After meeting the employee and taking him or her to a place where they could talk undisturbed, the interviewer started on a general topic and then allowed the employee's mind to go where it wanted to go. If it was that so-and-so of a supervisor, all right. If it was the girl friend, all right. If the fact that the company allowed married women to work, or the smoky air in Number Six, or the shortcomings of one's stepfather—all right. Here is a sample:

Interviewer: How is everything else in general?

Employee: Things are going along fairly well now.

Interviewer: Haven't they always been going on that way?

Employee: No, not exactly.

Interviewer: How's that?

Employee: Between the hard luck at home and the unfair treatment around here, why, I certainly would feel dumpy many a day.

Interviewer: Well, that's what I want to hear about.

Then follows a long story of how the employee's seventeen-year-old daughter had died of meningitis, and how his wife had a nervous breakdown, and how he had a running fight with a certain supervisor for many months. Most of the revelations seemed to have little bearing on

Men at Work

his job, but they were landmarks in his life. They made a great difference in his work.

In this way the staff collected a fifty-million-word human novel. Some of it made dull reading, some dramatic, some tragic. The releasing effect on the employee was startling.

"Gee, it's great to get this off my chest! . . ."

"This is the best thing the company ever did. . . ."

"It's swell to give everyone a chance to tell someone how they feel about this place. . . ."

"I would never think of going up to the office with the things I've told you. . . ."

As the program succeeded a curious thing happened. Employees began to comment on improvements which the company had *not* made. They noted, for instance, that the food in the restaurant was better. One man testified:

"Conditions have changed around here. The boss's friends used to get all the good jobs. Now we are getting a good break."

It was pure illusion in both cases. An employee releases his pent-up grievances. He feels better. Everything around him begins to look better.

The most unexpected result of the program was a wholesale shift in attitude as employees began to feel that they were marked individuals with valuable comments to make about how the company should be run. This feeling gave them a lift. Literally thousands of employees at Hawthorne got that lift. You could feel it in the air. Workers began to be *with* the company rather than against it.

The interviewing had an astonishing effect on supervisors. Their performance improved even before a single

The Hawthorne Studies

interview was held! As the reports came in supervisors began to learn more about the human stuff in their charge than they had ever dreamed of. They became more human and more understanding in their own attitudes.

Said one supervisor:

"Did you go to the last conference? Say, they are getting to be good! You know, I am getting a lot of help from them. I am learning to see the operator's viewpoint of things, and I really believe I am learning to do my job better."

Said an employee to an interviewer:

"Our section chief used to be very crabby. He made excuses to pick on us and bawl us out. But since the interviewing began he has been a regular prince and we can't figure out what has happened to him."

SOME CONCLUSIONS

The depression brought all experiments to a temporary end. Output curves in test rooms became meaningless as the threat of lay-off loomed ahead. Logically, one might expect that if a worker feared he would be laid off, he would work harder to provide a nest egg against unemployment. Nothing of the sort occurred. Test room records showed a sharp decline in output. Why? Because the spirit had gone out of the workers.

"We lost our pride," said one of the girls.

Western Electric now has a permanent system of personnel counseling. One counselor is appointed for every 300 employees. He has no authority. He alone has the code which connects the list of employees with the interview record. The company does not know what John

Men at Work

Robinson complains about, only the fact that complaints, duly classified, have been made. Without this protection, any interview program would be worse than useless. The average interview now takes eighty minutes. Nobody is interviewed who does not want to be. Very few object. The relationship of the counselor to the employee is like that of a doctor to his patient. He has also been compared to a father confessor and to a psychoanalyst in his office. He functions as a link between management and worker, striving to give a true account of the total situation in the factory, especially the social aspects. He spots tensions, grouches, buck passings, obsessions, misunderstandings, deteriorations of work and morale, and strives to eliminate them.

The research staff at Hawthorne are scientists. A scientist is a chap who cheerfully admits he is wrong when the experiments show a negative conclusion. Ordinary folks do not do that. They make up their minds as to what is right and wrong, and to hell with the experiments. I should do these scientists a grave disservice if I concluded that they had found all the answers to factory work in the machine age. They have found some answers, some hopeful leads, and a lot of blind alleys.

Since the industrial revolution began, managers of plants have been concentrating on output, forgetting that under the factory roof is a human society, as authentic as that of a South Sea Island fishing village. Anthropologists fit out expeditions to study villages in Samoa. This is the first time, to my knowledge, that similar techniques have been applied to a group living in the large wigwam we call a factory.

Underneath the stop watches and bonus plans of the

The Hawthorne Studies

efficiency experts, the worker is driven by a desperate inner urge to find an environment where he can take root, where he belongs and has a function; where he sees the purpose of his work and takes pride in achieving it. Failing this, he will accumulate frustrations and obsessions, and every so often break out in violent conflict. "Fatigue" and "monotony" are more effects of this frustration than causes of it.

For their neglect of the human function of production, managers have paid a high price in strikes, restricted output, revolts, and a vast sea of human waste. They have not realized that an age-old way of life has been destroyed, and that something equally binding must be put in its place or the machine age will ultimately smash up.

The best insurance against the totalitarian danger, we are told, is to "make democracy work." To some, this means only obtaining a high industrial output and military efficiency. To others, it means giving plain citizens new satisfactions and a new spirit, making each one feel deeply that he counts. The discoveries at Hawthorne suggest that both results can be achieved by one and the same method. They apply to little factories as well as to large. . . . There is an idea here so big that it leaves one gasping.

3

A BIGGER PIE

Report on Labor-Management Committees

IN UTOPIA the labor movement always moves through three stages—assuming, of course, that there are labor unions in Utopia.

The first stage is a fight to form a union where there was none before. Labor leaders are fighters. Managers fight back, answering strikes with lockouts, pickets with strikebreakers.

Stage number two is bargaining collectively with a recognized union. Labor leaders now negotiate more often than they call strikes. They want to increase their share of a limited income, as if they were cutting their members a bigger slice of pie. When labor tries to get more wages, the managers counter with steps to hold wages down and safeguard dividends.

In stage number three, workers and managers co-operate as the orators tell them to do in Labor Day speeches. Together they work to cut down waste and to raise produc-

A Bigger Pie

tion. The idea is that both slices can be larger if the pie itself is bigger.

Even on earth the third stage is sometimes reached. The Baltimore and Ohio Railroad and the men's clothing industry have had joint production committees for many years. These have been isolated examples, however, in a vast, turbulent sea of fighting and negotiating. But the war has suddenly precipitated several thousand industrial plants, employing millions of workers, into stage number three. The same thing has happened in Britain. All over the country managers are sitting down with workers in an attempt to increase production and hasten the destruction of our enemies. If the habits and procedures now being formed are driven in deeper as the war progresses, and if they stick after the war is over, a bigger pie is indeed in prospect and Utopia around the corner. I am making no prophecies. I am just recording an exciting beginning.

Come along with me and watch one of these new Labor-Management Production Committees in action at a factory in New Jersey. This company has established collective bargaining machinery with the CIO, and employs upwards of 6,000 workers, twice as many as in 1940.

As I am introduced to the committee members I try to identify managers and workers. Except in one case, I cannot be sure. Their appearance, dress, and speech are so similar that it is impossible to tell who is toiler and who is boss.

It would have been easy enough to mark off the two sides, if the meeting had been devoted to bargaining about wages or hours. The union men would have been on one side of the table, and they would have been arguing a case. The management men would have been on the other

Men at Work

side with counter arguments. But in this room everybody is on the same side of the argument. And the argument is: How can we produce munitions more rapidly and save man-hours and materials?

Four workers and four managers make up the Central Production Committee of eight members. In addition, there is the man who keeps the suggestion box records—a full-time job—and the head of the publicity department, who works on posters for the committee.

Everyone gives his frank opinion on each item of the agenda. There are no rows, and the differences of opinion seem to be *individual* differences, not labor versus management. Everybody calls everybody else by his first name.

SAMPLE DISCUSSION

As you read these words—if it is not too late at night—dozens of meetings like this one will be in progress from coast to coast. The talk that went on is a fair sample of what I heard at meetings in other companies, and presumably a fair sample of what live-wire committees are discussing the nation over. Let me describe it in more detail:

First, the chairman reads a letter from an employee named Gene Winters. Gene has posted a sign on the windshield of his car: EN ROUTE TO THE XY COMPANY. Since he has used this sign, Gene says that he has picked up various workers who have missed their buses, and so saved the assembly line quite a bit of time. He proposes that more stickers be printed and distributed to drivers. His idea is discussed and referred to the poster man. The latter prom-

A Bigger Pie

ises action in twenty-four hours. "We work fast around here," says the chairman. "No red tape."

Then comes a report on the extension of the company cafeteria, involving technical problems of priorities for kitchen equipment. The extension, I gather, is badly needed, for there are no other places to eat in the vicinity, and brigades of women are being taken on every day. The plant is working twenty-four hours, with three shifts.

Next, the committee gets to work on a new system for suggestion boxes and awards. This is the heart of production drive committees everywhere. A report on the results of the present system is read. In six months some 800 suggestions have been received, and 25 per cent have been adopted. It looks like an excellent report to me, but the committee is not satisfied.

"We can put firecrackers under a lot more of 'em," says the secretary. "The men and women right on the job know with their own hands and eyes what needs improving. When they toss an idea in the box it comes out of their personal experience. We ought to get better than 25 per cent."

The reward for an adopted idea under the old system is a badge—a neat, enameled pin to be worn on one's coat. The new system proposes war bonds, up to \$50, with a special \$100 bond for the best suggestion each month, and another for the employee putting in the largest number of adopted ideas. Discussion is lively. Why bring in bonds at all? Well, for one thing, many other plants do, and the word gets around. Suggestions come into the boxes all right without a financial incentive, but experience proves that they come faster when honors are combined with bonds.

Men at Work

"If a small war bond is given, and the idea saves the company thousands of dollars, won't the worker feel that he is left out in the cold?"

"It isn't between him and the company. It's both of them helping to win the war."

"Right," the chairman says. "This company isn't going to add to its net profits whatever the savings. They will be taxed away, or contracts will be re-negotiated. We are re-negotiating some right now. This is no time to concentrate on making money. We have all we can do making munitions."

The workers do not know much about the technicalities of contracts, and excess profit taxes. How are we going to make them understand it? "That's up to you, Ed; a good, snappy poster or leaflet to tell the story so that even the elevator girls can get it." Ed promises to do his best at once.

How about suggestions dealing with morale; should they receive awards on the same basis? Typical morale builders are discussed, such as the slogans: "He Who Naps Helps the Japs" and "Don't Shirk—Work." Everyone agrees that morale is important, but there is a general suspicion of concentrating the committee's activities on rallies, mottos, talks by returning heroes, and ballyhoo generally. "You can't measure it, can you? We want ideas that show up in the production charts, not a lot of hot air." It is voted to give awards only for specific suggestions which speed production, save materials, and can be measured.

And so the new suggestion system is gradually hammered out. It is due to start on the first of the month, and every detail must be prepared in advance. From the way

A Bigger Pie

the committee members go at it, you would think they were planning a new factory. One topic that holds them for a long time is how to get women to contribute more. Only 5 per cent of all ideas so far have come from women, and they number 30 per cent of the employees.

The chairman turns to one of the labor members. "How did you come out on that absenteeism test, Tom?"

"We came out swell. We got the records for this one department and picked out the fifty worst cases. Then we laid a copy of this little pamphlet, 'Absent at Roll Call,' on each man's bench. The pamphlet has a picture of a soldier dead in the front line because supplies hadn't come through. We slapped it down so everybody in the shop saw who got it. Only one of the fifty has been late since."

"Didn't it make them sore?"

"Sure, it made them sore as hell. But it wasn't the management ragging them; it was us, their fellow workers. It makes a big difference where the pressure comes from."

Bad transportation jams are reported in one department. Someone asks:

"Can't the transportation jams be referred to the car-pooling committee?"

"That's what they're doing right now. They found one girl who just didn't know how to get to the plant in a straight line. They routed her straight and saved her an hour a day and ten cents in car fare. There's some good ideas here for us to try out."

The chairman announces that improvements in transportation and car-pooling will be the first order of business at the next meeting, a week hence. "Ralph, bring all your figures. We've got a big headache before us. We

Men at Work

have cut out 700 cars by pooling so far, but we've got to cut more."

The noon whistle blows, and the meeting ends. After lunch the various members will go back to their regular work.

One gets a strange feeling out of this. Somehow you are not in a factory at all. You are not studying a "labor problem." You are not watching union men and their employers. You are watching human beings working together for something which obliterates the lines that are supposed to divide them, and you think how grand if things could go on like this, everywhere, always.

You know that they will not go on, everywhere, always. But it is something to see it happening once. It is something to know, at least, that it can happen.

THE BACKGROUND

Labor Management Committees were proposed by Donald Nelson of the WPB in the early spring of 1942. The plan was purely voluntary for war plants to adopt or not as they saw fit. The first response of labor was favorable; Presidents Murray of the CIO and Green of the AFL endorsed the idea. The first response from management was a cry of pain. Was this another plan to turn production management over to the unions? Nelson assured the managers that it was not. Further, it had nothing at all to do with collective bargaining. It was to deal entirely with production and morale, and avoid wages, hours, and grievances. With these flat assurances, the outcries largely subsided, and committees began to form. By the end of

A Bigger Pie

the summer there were 1,200 of them, and the following spring, close to 2,500. By 1944 there were more than 5,000.

The WPB officials issue no orders; they act as clearing-house, clinic, and spiritual adviser. When a plant wants to organize a committee, the WPB helps it with advice, literature, posters, and, most valuable of all, the pooled experience of other plants. If Company A in Newark develops a rip-snorting system of car-pooling, WPB officials want to hear about it so they can pass the plan on to Company B in Chicago and Company C in San Diego.

The most effective organization has turned out to be a central committee, half appointed by management, half by the union, or elected by the workers if there is no union. Each department in the plant should have a small sub-committee, say one worker and one manager. The sub-committees do the day-by-day work, reporting regularly to the central committee. Some plants also have worker "leaders" who assist the sub-committee in canvassing every individual in the shop. Leaders are very helpful in putting on a bond-selling rally or checking up on absenteeism.

Suggestions have been requested on taking care of tools, preventing breakdowns, better lighting, adapting old machines to new uses, cutting waste and salvaging scrap, breaking bottlenecks, fuller use of machines, absenteeism. For every eight hours saved, a man-day is added to the national pool of manpower.

IDEA MAN

Let us look at the place where suggestions for increased production originate. We go into a huge room humming

Men at Work

with turret lathes. Over in the corner at a bench covered with hand tools is a big red-headed man with blue eyes and plenty of chin. His job is to repair dies. He has won the award for the outstanding suggestion in this plant. He designed a new set of dies which saved material and operations in manufacturing fire-fighting equipment for planes and ships.

I shake his broad hand and congratulate him. "Have you been thinking about any other improvements?"

"Yes, sir. I am working on fifteen others." He produces a neat hand-written list from the corner of the bench.

"When do you think about them?"

"When I'm driving to work. I think about them too when the broken dies come over to this bench; how to have fewer broken."

"Did you ever put in any suggestions before the production drive started last spring?"

"No, sir. I've been here many years, but I kept them to myself."

"Why?"

"Because the foreman might think he was not onto his job. He might get sore."

"He doesn't think so now?"

"No. We're all in it together now. I put in all the ideas I can, unless they are crazy. I get hold of a crazy one now and then. But I think up more good ones than I used to. Now you take this strip of metal here. . . ." He could have talked all afternoon explaining these excellent technical ideas—which he used to keep locked up in his head.

The plant this idea man worked in was one of four I visited in New Jersey. They employed nearly 50,000 workers among them. Three had collective bargaining agree-

A Bigger Pie

ments with the CIO, one with a local independent union. All had excellent labor relations before the drive started. These plans belonged to the top drawer group, the 20 per cent of committees the country over which are doing an outstanding job. Another 20 per cent, I gathered, were in the bottom drawer; paper organizations doing no harm and no particular good. The rest are on their way, but with a long way to go.

GOOD AND BAD COMMITTEES

Successful production committees usually are found in union shops. Without a union there is no matrix from which to choose the labor members, no discipline to hold them on the job. But the union must be well past the fighting stage, and over into the second stage of smooth collective bargaining. If the workers do not trust the management, or vice versa, the chances for effective co-operation are remote. Morale in the shop is bad by definition. The appeal to patriotism may override this barrier to a degree, but only in a few cases has it accomplished a real working team.

There is one company in the Middle West where the president is the whole show. He sees to it that the proper workers are appointed, as well as the managers. He puts on a rally with visiting heroes every few days. He has a company band of fine-looking girls. His suggestion boxes are painted in beautiful colors, and his posters dazzle the eye. He says that production is increasing, and perhaps it is; but as labor-management co-operation the thing is a phoney, about as spontaneous as a Fourth of July parade.

Although a successful committee practically depends on

Men at Work

good collective bargaining machinery, at the same time every collective bargaining issue, involving wages, hours, or working conditions, must be shunned like the plague. Even borderline cases must be thrown out. Stage two of our Utopian progression must not be mixed up with stage three. There seems to be a psychological law operating here. Committee members must not go into a meeting taking sides. They must go as one team.

In three of the plants I visited, I found transportation and car-pooling systems worked out by the committees with incredible precision. They had full-time employees plotting the movements of every worker's car with colored pins on great wall maps. They had a card file showing the transportation route of every worker in the plant, cross-indexed three ways. In two cases the transportation department had taken over the functions of the workers' local rationing boards, scattered through the metropolitan area. All gasoline and tire rationing was centrally handled. Employees had only to come to the office in their own plant, saving the hours they used to spend cooling their heels in local rationing boards all over the district.

One plant makes metal hose, vital in the engines of bombers and fighter planes. The committee got hold of a complete airplane engine of the latest design, mounted it on a little truck, and had it pushed down the aisles of all the departments, so that every employee could see exactly how his work fitted into the engine and thus into the war effort. He could identify himself with the fighting front. This identification of worker with fighter is encouraged by committees everywhere, and many of the methods are very ingenious.

Another committee had set up a monitor system,

A Bigger Pie

whereby every day in each department a worker is appointed to act as official housekeeper. He patrols the shop at regular intervals looking for oily rags, fire hazards, bad lighting, crates left around to trip over, blocked passages, machine scrap not cleaned up. It is his shop for the day, and he is the cop. "Don't let that guy out of here until he cleans up around his drilling machine!" In due course every worker in the company will have felt personally responsible for a clean, efficient shop.

These are perhaps little things that we have been watching. But at a score of points we have seen the latent energy, good will, and intelligence of the ordinary worker being drawn out and encouraged, occasionally bursting into a really brilliant technical improvement.

Ever since the machine age began, that latent energy has been pretty well sealed up, with a loss to civilization that defies calculation. It is beginning to come out now. In the plants where production committees are really functioning—perhaps 1,000 of them the nation over—a great, rich mine of human effort is being slowly opened.

Will the mine shut down when the war ends? Of all the managers and workers I talked to, not one thought so. To a man they believed that something had been discovered too valuable to lay aside.

4

EDUCATING THE BOSS

*The Job Relations Program of the TWI**

A WISE manufacturer at a crisis in war production said: "The most critical shortage today is not oil, rubber, steel, or ships; it is not even manpower. *It is the intelligent management of men.*"

American industry has always suffered from this shortage. Only the most progressive companies have realized that the way to get maximum co-operation and output from a group of workers was not to drive them but to understand them. The war has turned this trickle of understanding into a flood. Through the Training Within Industry program of the War Manpower Commission, the bosses are being educated. Let me take you into a conference room in a typical big war plant and show you what they are learning about human relations.

* The next three sections describe the wartime program for training supervisors conducted by the War Manpower Commission. This project, called Training Within Industry, consists of three courses—Job Instruction, Job Methods, and Job Relations. The present description, prepared originally for *Reader's Digest*, has been revised with figures to January, 1945.

Educating the Boss

You see a dozen plant foremen or supervisors in their shirt-sleeves sitting around a big table, with pads, pencils, and a small printed blue card in front of each one. At the head of the table sits a chairman or leader; he must not be called a teacher, nor must the conference be called a class. He is not telling the men; he is steering the discussion so that they can tell themselves. Behind the leader is a blackboard covered with such statements as these, heavily underlined:

WHAT RESULTS ARE YOU LOOKING FOR?

GET THE FACTS

WEIGH AND DECIDE

POSSIBLE ACTIONS

PEOPLE ARE DIFFERENT

"Now, Jim," the leader is saying, "let's have one of your problems hot off the griddle."

Jim, a big man with a serious face, pushes back his chair and comes up in front of the blackboard. "Yes," he says, "I've got a problem, a mean one. It's like this." The men lean forward in their chairs, concentrating on what Jim is up against.

"I've got a man, Sam Fuller, running a special machine. He can make that machine eat out of his hand when he's going right. He's been with the company eight years and I don't know how I could replace him. He's married, with two kids in school.

"About two months ago Sam's work began to fall off. He took to coming in late. Now every night when he checks out he hooks up with a couple of rummies and is drinking himself blind. I've got to do something about it mighty soon before the whole shop falls apart. If he goes, I'm sunk."

Men at Work

The leader steps behind Jim to the blackboard. "You have a real problem there all right, Jim. Now, men, let's start from the beginning and put it through the works. *What does Jim want to accomplish?*"

Various answers come from the men around the table and the leader writes them on the blackboard:

"Get Sam back into regular production."

"Stop his drinking."

"Get him interested in his job once more."

"Now what is our first step again?" asks the leader.

Some of the men pick up their blue cards and read the answer; others apparently know it by heart. With one voice they chorus:

"Get the facts!"

"All right, Jim," says the leader, waving his chalk, "let's have the facts. We'll put them down one by one."

The case of Sam Fuller begins to develop on the blackboard. First come the points his boss has mentioned, set down in short, simple sentences; then more explanations, under the leader's skillful questioning. To the men around the table the situation seems to be as absorbing as a mystery story. Each of them is studying clues and hunting for the solution—that is, for the one *right action* for Jim to take in dealing with Sam. It appears that Sam's wife decided she was going to help lick Hitler too. She took a war job about two months ago—the time Sam's state of collapse began. Why is Sam so devastated? What will cure him? The conference comes to the conclusion that the first thing for Jim to do is to see Sam's wife and if possible get her to go home to the children.

The men around the table relax. The mystery is solved.

"OK, Jim?" the leader asks.

"OK, I'll see her. It's the best thing to do."

Educating the Boss

"Let us know how you make out. Now whose turn is it with the next problem?"

Maybe this recipe will work in Sam's case, maybe not. The men around the table will be disappointed if it does not work. As one thinks back to the traditional foreman of what might be called the Prussian school of management—"You-do-it-the-way-I-tell-you-and-never-mind-why-and-no-back-talk"—the contrast is startling. What would such a foreman have done with Sam? Fired him out of hand without stopping to find out what had happened. The result might have been unemployment for Sam while his wife held down a good job and "wore the pants," followed possibly by a divorce, a crisis for the children, a train of family disasters. Meanwhile, at the plant a series of successors to Sam would never run his machine quite right.

THE FOREMAN'S JOB

Perhaps the traditional Prussian foreman has been exaggerated. Certainly there have been all kinds and no two alike. But his power over his men can hardly be exaggerated. He, the supervisor or foreman, may be the only representative of management that the worker ever meets. Like a sergeant in the army or a teacher in a primary school, he is the point of contact, the transmission gear, the vital connection between steering and engine, between the few who plan and the many who produce.

After being promoted because he is quick at the bench, the typical foreman has to put away his tools and become a leader of men and women—a very different instrument. He may work out some sort of system for himself. One old-timer, quoted by *Fortune*, explained how he received



Men at Work

a new employee. " 'I jest stand there . . . and stare him down, to kinda show him how dumb he is.' 'And then?' 'Then I spit.' "

This old-timer at least realized that an important relation had to be established between himself and the new man. A less resourceful foreman, facing this responsibility with no preparation, may try to ignore a new arrival. The men gradually become his enemies and he becomes their tyrant. Lacking a natural gift for managing men, he is simply a misfit. The resentment and hatred such men have kindled in past generations in the factories of the world are beyond computation. Yet most of them were not evil; they just did not know the principles of leadership.

Think of the new problems foremen have to cope with today:

A green recruit every day instead of every week, and greener than ever before.

The slow-learning worker who does not understand his part in the whole job.

The special problems of women, youngsters, Negroes, coming into the department for the first time.

The girl who refuses to do certain kinds of work, and the lady from suburbia who high-hats her shopmates.

The superior employee who expects to be promoted once a month.

Yes, it is none too early to start a training camp for bosses.

A NEW ART OF MANAGEMENT?

For some years now the old line foreman of the Prussian school has been giving ground to a new type of super-

Educating the Boss

visor. A kind of revolution in management was going on here and there long before the war. The famous experiments in the Hawthorne plant of the Western Electric Company laid down part of the new pattern. Other progressive managements added their contributions, but only in exceptional plants, until the war speeded the process and multiplied it many times.

These conferences you have been listening in on are not confined to a handful of companies. Some fifteen thousand plants in forty-eight states have felt the impact of the Training Within Industry programs. More important than the new plastic cars, the new prefabricated houses, which we are told will come out of the war, may be a whole new art of management.

Four experts in personnel and training are chiefly responsible for the present program—C. R. Dooley of Socony Vacuum; Walter Dietz of Western Electric (who had been in close touch with the Hawthorne experiments); M. J. Kane of Bell Telephone; William Conover of U. S. Steel. They organized TWI, Training Within Industry, as a clearinghouse for up-to-the-minute methods in managing men. They appointed advisors from both management and organized labor. They were well aware that the best idea ever conceived may fail unless the workers' assent is first secured. Mr. Kane says: "You can't ram improvements down people's throats."

These men—sometimes called the "Four Horsemen"—operate the TWI as a branch of the War Manpower Commission. They have issued three courses of training which their field representatives offer to war industry without cost. The three courses are called Job Relations, Job Instruction, and Job Methods. They are so popular that

Men at Work

factories now must have a priority from the War Manpower Commission to qualify for the training. The priority once in hand, a plant receives very thorough attention, with all three courses taught, checked, and double-checked.

Any supervisor in any plant, say the Four Horsemen, needs five kinds of skill. They are:

1. The detail of his own production task. This varies from department to department and from plant to plant. TWI has nothing to offer here. The Encyclopedia Britannica would not be long enough.

2. Company rules and customs—pay, pensions, vacations, union agreements. TWI keeps strictly out of this.

3. The ability to pass on the supervisor's knowledge to workers. This is a general skill to which TWI can make a contribution.

4. The ability to look critically at methods of work. TWI can do something about this.

5. The ability to get along with people and lead them. Here also TWI can be of great help.

If a supervisor goes from General Electric to the Ajax Cement Company, the detail of his work becomes entirely different. Plant rules and customs change. But he still can use the last three skills. *They are equally helpful in any company.*

In Job Relations the Four Horsemen tackled perhaps the most important problem of all—the skill of leadership, of getting along with people. Mr. Dale Carnegie tackled a similar problem in his famous book, but he never had such a specific target to shoot at—1,800,000 supervisors charged with getting out production in wartime from willing workers! They will not work to the lash; they will not

Educating the Boss

work to the bawling-out method. They will work their best only if they are respected as human beings.

By November, 1944, almost 400,000 supervisors had learned about Job Relations, with new graduates at the rate of 3,500 to 4,000 a week. The course has a strong appeal to everyone who handles people. It gives a simple key to the basic principles of leadership.

Not only war plants demanded JR, but railroads, hospitals, the Red Cross, the U. S. Employment Service, CIO shop stewards, at various times undertook it. Indeed, the method would be as helpful to a matron who wants to keep on the good side of her one maid—and what matron doesn't these days?—as to the giant corporation with 100,000 on the pay roll. I found a superintendent of schools taking the master institute course in New Haven. He is going to be a trainer in industry during his vacation time. "But," he said, "I'm going to use it when I go back. I have 80 school marms and 4,000 parents on my hands!"

CLEARING THE LINE

Between a leader and any of his followers runs a line of human relations. Think of it as a kind of telephone wire. When the line is straight and clear, relations are good. The boss understands you, you understand the boss, and both of you are working hard and well. If the line is tangled and bent, you are not understanding one another. Tempers are short, work is bungled, materials are spoiled. If it is war work, essential production is held back by that much. If the line breaks, human relations cease and there is complete non-co-operation, as in a strike.

Men at Work

Job Relations Training provides a way to keep the line clear. The supervisor learns it by using his own experiences as a textbook in the conference room, where they are run through in slow-motion. Then he goes back and tries the system out on the next problem he has to face in the shop.

The only other textbook is a little blue card, 2½ inches wide and 4 inches long. On one side are the principles for keeping the line clear:

FOUNDATIONS FOR GOOD RELATIONS

Let each worker know how he is getting along.
Figure out what you expect of him.
Point out ways to improve.

Give credit when due.
Look for *extra* or *unusual* performance.
Tell him while "it's hot."

Tell people in advance about changes that
will affect them.
Tell them why if possible.
Get them to accept the change.

Make best use of each person's ability.
Look for ability not now being used.
Never stand in a man's way.

People Must be Treated as Individuals

Educating the Boss

On the other side of the card is the procedure to follow in any given problem:

HOW TO HANDLE A PROBLEM

1—GET THE FACTS

- Review the record.
- Find out what rules and plant customs apply.
- Talk with individuals concerned.
- Get opinions and feelings.
- Be sure you have the whole story.

2—WEIGH AND DECIDE

- Fit the facts together.
- Consider their bearing on each other.
- Check practices and policies.
- What possible actions are there?
- Consider effect on individual, group, and production.
- Don't jump at conclusions.

3—TAKE ACTION

- Are you going to handle this yourself?
- Do you need help in handling?
- Should you refer this to your supervisor?
- Watch the timing of your action.
- Don't pass the buck.

4—CHECK RESULTS

- How soon will you follow up?
- How often will you need to check?
- Watch for changes in output, attitudes, and relationships.
- Did your action help production?

Men at Work

When a new machine is set up in the shop, a handbook often comes with it containing full directions for operation and repair. When a new worker enters the shop, no handbook comes with him. His supervisor has to make one in his mind. A new employee usually judges the whole company by his supervisor, perhaps by the impressions he receives on the first day. If the boss lets him cool his heels, then casts a baleful eye in his direction and says, "Richards, here is a job that even *you* could do"—the chances of getting Richards' co-operation from then on are remote. The line is broken before it is set up.

Let us illustrate some of the "foundations for good relations" as shown on the little blue card.

Let each worker know how he is getting along. A worker goes home and his wife asks: "How is the new job going?" He replies: "I don't know; nobody seems to give a hoot." The trainer reminds the supervisor to give the new worker the benefit of the doubt. Give him a hand-up to start with. If Richards is scrambling his job, don't bawl him out—particularly in the presence of his shopmates. Go over to his bench and say: "Look, this might be an easier way to do it." Then show him the better way, and give him a hand as he catches on.

Give credit when due. If a man has been sick, yet stays on at work to finish an important job, maybe the supervisor can't give him a raise, but he can let him know what a help it has been. He can go farther and let the whole team know. The sooner the better. Most people can learn more from praise than from censure.

Tell people in advance about changes that will affect them. The manager called Supervisor Powell into his office and told him that a Negro mechanic would report to

Educating the Boss

Powell for work the following Monday. No colored workers had ever been employed in this plant before. Here was a drastic change with explosive possibilities. Powell swallowed his dismay and studied his blue card. "Tell people in advance." He talked individually to the other supervisors in his department, and also to the "natural leaders" among the teams of the rank and file. He explained the whole situation: the colored worker on his way, the presidential order forbidding racial discrimination, the company's contract with the government which has a clause to the same effect, the shortage of mechanics in the plant and in the city. He told them that other Negroes would probably be hired later.

There was an uproar, as he expected. Some of the men said they would not stand for it. Supervisor Powell gave them plenty of chance to blow off steam. Then he pointed out that the company really had no choice in the matter. Eventually they came around. Before the new mechanic arrived, the storm had spent itself.

But Powell did not stop there. He hunted up the mechanic at his home and told him that he was the first Negro in the plant, that he might run into some prejudice to start with. He asked him to lean over backwards in correct behavior—not only for his own good, but for that of other colored workers who would be hired later.

The new mechanic came; he was careful, the shop accepted him. No explosions occurred at all. The supervisor had cleared the line.

Make the best use of each person's ability. The trainer asks in the conference room: "Have you ever had a man go sour because he felt he could do a harder kind of work than you gave him to do?" Some of the supervisors nod

Men at Work

their heads. "Have you ever looked around your shop to see if you had that harder job for him? Look carefully for ability now going to waste. Don't hold a man on a job, just to keep things quiet, if you know he can do a more important job. Never stand in a man's way."

People must be treated as individuals. Every human being is different. The supervisors are cautioned not to be "die casters," arranging people in rigid types like "good mixer," "chronic kicker," "dumbbell," "tough customer." Don't be a "just-liker." The new man may remind you of your old friend Bill Bowen, but don't assume that he will be just like Bill Bowen. Nobody is just like anybody else. Even identical twins have their differences.

Don't be a "Go, No-go" judge. You can't tell whether a worker can make a go of the job just by watching him for a few minutes. Some people warm up slowly; some need encouragement to warm up at all. People are never "either-or"; they are somewhere in between. It is up to you to find out which layer of in-between.

Other ideas for clearing the line are brought out in the conferences. The supervisors absorb them almost thirstily. When you are looking for the facts to solve a problem, they are told, don't do all the talking yourself. The other fellow has facts *you* want; you get them when *he* talks. Don't interrupt. When he stops talking, you stop getting hidden facts. Never argue, but don't just agree either; reserve your judgment. Encourage him to talk about things which interest *him*. These may be the facts which cause the problem and will help you to solve it. People react as a whole. Their job is only part of their whole life. The trouble may lie beyond the shop—at home, or with the girl friend, or with an unpaid debt.

Educating the Boss

Try to put yourself constantly in the other fellow's place. How would *you* feel in his boots? When a new worker arrives, explain the whole situation to him—how his work fits in to the final product, how he aids directly in the war effort. If possible, take him around the plant and show him the steps leading up to the finished output. Make him feel that he has an important role to perform.

In approaching every problem, supervisors are taught to ask one basic question and then to use the four-step method indicated on the card. It is impossible to over-emphasize the importance of that basic question: *What do you want to accomplish?* Just by stopping long enough to ask it, one goes a great way toward the solution. A supervisor in a war plant usually wants to accomplish three major things:

Keep production moving.

Keep the worker satisfied.

Keep the group of workers under him confident in his leadership.

If the action he takes gives negative results in any of these three, he has not solved his problem. Action to save face, to show who's boss around here, to expand one's ego, to work off resentment, will usually only make the matter worse. Such action is impossible if one looks at the blue card first and writes down what he really wants to accomplish.

Joe Smith was a good worker and his earnings were high. The department was on a six-day work week, but Joe figured he made all the money he needed in five days, and had fallen into the habit of staying away Monday. Presently, however, Joe got married, and began to work six days a week regularly. This went on for several months.

Men at Work

One day a general increase in wages was announced. The next day Joe didn't show up. Harry, his supervisor, sized up the situation in a flash. The raise had again put Joe in the position where five days' work gave him all the money he needed. Harry at the time had no little blue card.

Jumping to another conclusion, he decided to teach Joe a lesson. When Joe came in the following day, Harry was waiting for him by the locker room. "Never mind changing, Joe. You're laid off for a week. That'll give you a chance to think over what's in your envelope." Joe said nothing. His face, Harry said later, was a study. He turned on his heel and walked out.

A few days afterward at lunch another supervisor inquired:

"Why did you treat Joe so rough?"

"He rated it, didn't he?"

"I don't think he did. Neither does anyone else in the shop."

"I noticed the atmosphere was a bit thick," Harry admitted. "What's the idea?"

"Well, you see Joe's father had an automobile accident the morning after the pay raise, and Joe had to look after him. The old man was badly hurt."

"Why didn't Joe let me know?"

"He thought he did. He asked the guy next door to give you a message but the guy forgot. When Joe walked in the next day he thought you knew the whole story."

This case—a true one—gives us a dramatic contrast between the old way and the new. Under the old system, the boss stands on his ego, jumps to conclusions, and snaps out orders. The result is a big hole in production, a good

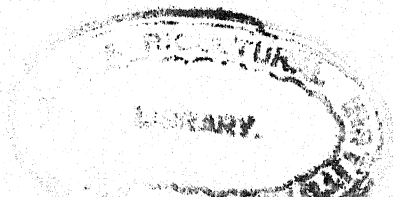
Educating the Boss

worker burning with a sense of injustice, the whole shop on edge. Under the new system, the supervisor delays his response, determines what he wants to accomplish, gets the facts, reviews them carefully. When he takes action, the chances are strongly in favor of its being the right solution to the problem.

I have sat in at master institutes of the TWI where trainers are being trained. I have watched the trainers passing on their knowledge to first-line supervisors in factory conference rooms. These programs are not exercises in paternalism or philanthropy. They are not animated by any kind of uplift; on the contrary, they are designed to obtain the greatest possible weight of metal to throw against our enemies. And they have incalculable possibilities for the future.

Here is the profoundly exciting thing to me: *that the human approach is also the approach which results in maximum production.* Hard experience has shown that the old Prussian methods are not only inhuman; they are grossly inefficient. It is now being proved in thousands of war plants that the best way to achieve results is to treat workers as men, not as hands.

After the war will all this still seem important? This much at least seems clear: Supervisors who have had this training in human relations will go on using it *because* it works. They will use it wherever they are. A man who has been shown the value of oil in an engine, is never going to fill his crankcase with sand again.



5

SHOW-HOW

The Job Instruction Program

DID you ever try to teach a simple manual operation to anyone—a child, a student, a worker, a maid, your wife? Perhaps you *told* them how to do it and wondered why they didn't get it. Or you may have *showed* them how to do it and still produced a solid mahogany reaction. Or did you use the one sure-fire method for teaching anybody to do anything which involves hand and brain?

If "one sure-fire method" sounds extravagant, consider some of these results:

It used to take three weeks to teach a man to grind quartz crystals for lenses. Now it takes three days.

It used to take five days for a new employee in a die-casting company to learn to inspect hand grenades. Now he can learn in one day.

A green inspector for a certain kind of textile could not be given full responsibility till he had been broken in for a month. Now he is ready to go after one day's instruction.

Show-How

Up to the war most shop training was by accident and luck. New men were hired, placed on jobs, and allowed—or dared—to learn. Gradually most of them did learn, but with plenty of breakage, delays, cuss words, and accidents. Many old-timers never did learn to do the job right—like agile tennis-players who have never mastered the fundamental rhythm of the game. The attitude of the average foreman has been, to quote one of them: “Well, I had to learn it, didn’t I? You go ahead and learn it the same way.”

The war brought this educational masterpiece up short. Too many Americans had to learn too many things too fast for such slipshod methods to be tolerated. The war might easily be lost while they floundered around in the good old university of hard knocks. Take a certain war plant in Bridgeport. In 1940 it had 2,300 employees and 100 supervisors. By the end of 1942 it had 15,000 employees and 550 supervisors. The new supervisors were mostly promoted from the bench; the new workers came from the ranks of the unemployed, from the farms, from the high schools, from the retired list, from kitchens and even drawing rooms. Expand this example to all war plants—50,000 of them—and you see the magnitude and urgency of the teaching task. At the height of expansion about a million workers a month had to find their way around a new job. Thousands had never worked at any manufacturing job before.

The Training Within Industry service of the War Manpower Commission undertook to work out a simple, standard procedure for supervisors to use in passing their know-how along to the new men. Obviously, it was not a matter of all-round skill, but rather of specialized or

Men at Work

single operation skill—the sort of thing you or I can learn in a day, a week, or a month, if we have to. Most jobs in modern industry are like that.

The original draft of this method was worked out by a well-known industrial engineer and tried in a few picked plants. When the “bugs” had been eliminated, it was offered to war industry on a voluntary basis—and snapped up. As of January 1, 1945, more than a million supervisors—half of all the factory foremen in America—have been coached. This means that upwards of 12 million workers have learned their new jobs efficiently, instead of by guess and by God.

Here we are in a factory conference room again. Here are the supervisors around the big table, with the trainer and his blackboard at the head. First, to put the group at ease, he tells them to take off their coats, to smoke if they want to, and call one another by their first names. Next, he disarms suspicion by saying:

“I’m not here to tell you how to run your jobs. I know little or nothing about the technical aspects of your work. I’m here to discuss one matter common to all jobs—namely, job training.”

Then he goes on: “Even that is a broad field. The particular phase we will discuss at these sessions is: *How to get a man to do a job correctly, quickly, and conscientiously*. We are going to take apart the process of instruction and see what makes it tick.”

Explaining pedagogic theory to shop foremen would seem a tough assignment. Our trainer quickly returns to solid ground with a concrete illustration:

“For instance, take the job of learning to tie an under-writer’s knot. It is one of the first things an electrician

Show-How

must learn. I'm going to start by telling one of you how to tie it. Who'll volunteer?"

A serious-minded foreman with large rimless glasses raises his hand. "Fine, Tom," says the trainer, "come right up here. Now listen carefully. I will speak slowly and clearly." Tom's intelligent eyes focus on the task in hand. The trainer proceeds:

"Take a piece of ordinary, twisted lamp cord. Hold it vertically with your left hand, between thumb and first finger, six inches from the end. Untwist the loose ends, forming a V. Straighten the ends between thumb and first finger of the right hand. Take the right-hand loose end with the right hand, making a clockwise loop, bringing the loose end across *in front* of the main strand. Take the other loose end . . ." And so on, clear as a bell, to the end of the story, with the knot pulled taut.

But already the intelligent look has drained out of Tom's face, giving place to a blank stare. The trainer takes an actual lamp cord out of his pocket, gives it to Tom, and asks him to tie the knot. Tom is too intelligent even to try. He puts the cord firmly down on the table. "I couldn't tie it to save my life," he says. "I lost track about the third sentence."

The trainer smiles. "I don't blame you. You would have been an Einstein if you hadn't. *Telling*, alone, is *not* good instruction. Most people just don't get things through being told. For one thing, many operations are difficult to describe in words. For another, few of us can use the exact words necessary, anyhow. Each shop, furthermore, has technical or special names for things which a newcomer can't recognize." Tom goes back to his seat, and the trainer illustrates again, with an anecdote:

Men at Work

"That reminds me of the boss in a repair shop who told a new worker, 'Go get the old man.' The 'old man' was shop slang for a portable rigging device for a drill press. The new worker was both strong and willing. Presently he returned with the plant superintendent feebly struggling in his arms."

This story gets a laugh, and the trainer returns to his lesson.

"Thousands of workers are being *told* what to do this very minute, all over the country, but how many of them really understand what it's all about? Tom couldn't understand, and we all know Tom is nobody's fool. *If the worker hasn't learned, the instructor hasn't taught.* Paste that in your hat for always. Tom didn't learn, because I did a rotten job of instructing.

"Now who wants to be *shown* how to tie the under-writer's knot? All right, Bill, step right up here facing me. Now I'm not going to say a word. Watch carefully."

Bill, a heavy-set supervisor, watches the process as if his life depended on it. The trainer makes a right-hand loop, a left-hand loop, crosses the cords this way and that, and pulls them taut. The knot is tied. He then presents Bill with a fresh piece of cord and tells him to go to it. Bill starts bravely, and presently works himself into a veritable cat's cradle of tangled cord. "No good," he says, and tosses the wreck on the table.

The trainer smiles again. "I never yet had anybody do it right the first time. Showing, alone, is no better than telling. Most showing is done backwards, anyhow. Bill was standing opposite me, so that all my right-handed motions looked left-handed to him. Same thing happens when a worker is *shown* how to run a machine by look-

Show-How

ing over the top of it. Countless thousands of employees are being *shown* how to do their jobs at this very moment. How many of them understand?

"People *can* learn through telling or showing, but it takes a long while. Now there is a sure and dependable method that works every time. It represents twenty-five years of test and experience in the most progressive plants of this country. Who will volunteer to tie an underwriter's knot so that he'll never forget it? All right, Harry, come right up here beside me."

Harry has gray hair and he stoops. He looks rather less alert than the first two volunteers. This time the trainer begins with a short explanation of the purpose of the knot.

"Suppose," he says, "you are going to assemble lighting fixtures for one of the Army camps. This knot relieves the strain on the fixtures. If it isn't tied right, the whole place may burn up. It's a pretty important thing for you to learn. All right, you take a cord and follow along with me."

Now the trainer both tells and shows, but he does far more. He makes Harry *use his own hands*, understand each step with his mind, and get the whole process into his nervous system. Harry quickly masters the knot. After he has tied it successfully half a dozen times, he is asked to demonstrate it to the trainer. This is most important. If he can pass on his knowledge to somebody else, he has really learned. He grins widely as he demonstrates the new trick.

These are the main points in the sure-fire method of instruction. Like most other sure-fire actions, they are very simple: Don't just tell them, don't just show them;

Men at Work

but make them do it as you stand over, stressing the key points. Then have them do the job on their own and explain it back to you.

The foremen, much animated now, discuss the demonstration and apply it to their own specialties. As I watch I am reminded of where the word *understand* comes from, according to Allan Upward. A father in remote times is teaching his boy to shoot a bow and arrow. He leans over the boy from behind, grasping the boy's hand in his and guiding him while the bow is drawn. No word is spoken. The boy, standing under the father, is "understanding" how to draw the bow.

While Harry is rehearsing his new knowledge, I am reminded again of a trick which used to save me hundreds of miles in the old days when one had gas. I would stop the car and ask how to get to Blotz Center. But I would not step on the throttle as soon as I heard: "Take next right, then left at second traffic light, then swing around rotary. . . ." No, sir. I would sit still and say to my informant: "Would you mind correcting me as I repeat your instructions?" The number of times I have had the instructions balled up passes all belief! But after I have repeated them once correctly, I get to Blotz Center on the nose. The instruction sticks.

The human nervous system behaves according to its own rules. It refuses to learn much if you stuff a lot of things into it very fast. It learns better if you let in a few things and then act them over, or repeat them in your own words. Job Instruction is based solidly on this psychological principle. The Prussian foreman, who dumped a new worker down at a machine and told him to "watch

Show-How

what the other fellow does," no doubt wondered why new workers were all so stupid.

SOME RESULTS

"Machine fear," which used to be a common disease with new employees, has in many cases been entirely eliminated. The new system recognizes the worker's importance, captures his interest at once, and causes him to be curious about his work, the healthiest kind of symptom. He has a complete picture of his job in relation to other processes in the department, to the final product and to the war. *He knows exactly where he fits in.* In one department of a certain munitions plant twenty-eight foremen, applying JI, have taught 118 new workers twenty-four different kinds of jobs. As a result, the saving of man-hours during the learning period alone runs from 20 to 80 per cent.

For the country as a whole, it appears that men and women learn their jobs about twice as fast after foremen have grasped the significance of the underwriter's knot. In many cases the saving is more dramatic, like the six-to-one saving for the lens-grinders we noted earlier. Perhaps the textile inspectors, at twenty-six-to-one, are the top example.

Here is a big company whose whole inspection staff was off the beam. The walls were covered with elaborate notices on how to inspect properly, and still the new examiners let flawed parts go through. What was wrong? They asked a TWI representative. He saw at once that *telling* inspectors the right method did not get across. So the

Men at Work

whole force was then retrained by JI and a great improvement was registered immediately.

When the same company needed a flock of policemen trained in jiu-jitsu, to guard a new plant, they had them trained by JI, which made short work of the complicated wrestling techniques. Another company needed ninety firemen. Trained firemen were scarcer than hen's teeth, but JI turned total greenhorns into good firemen in record time.

Still another company lost all its truck drivers to the Army. The management decided to employ 100 women to man their fleet. You know how women are—or are supposed to be—behind a steering wheel. So just to be on the safe side the whole brigade were put through JI. All the steps of driving a truck were broken down, analyzed, and fed into the girls' nervous systems on the underwriter's knot principle. Now the trucks are driven more safely and competently than before.

A striking case is that of a company whose first-aid department was nearly swamped with minor accidents. Analysis showed that most of the accidents were cuts in the hands and fingers of machine operators, and that most of them came from one department. The whole crew was then retrained from the beginning by the JI method. The accident curve dropped so low that the first-aid ward had a well-earned rest.

The general superintendent of a great aircraft plant says: "We would have been sunk without JI. The average instruction time per job has been reduced from six months to between two and three weeks."

These results seem magical and often they are. But the magic fades out pretty quickly unless top management is

Show-How

really convinced and follows up the original conferences with a continuing program.

Job Instruction was designed for war plants. You can't keep a good thing down, however. It has since been used to train workers in hospitals, railroads, bus lines, street railways, taxi services, pipe-lines, inland water transport, airlines, garages. The Mayo Clinic at Rochester, Minnesota, has adopted it. A copper company in Mexico no longer has to import workers from the United States to operate its great electric shovels. Mexican Indians learn the job readily through JI.

These are only a few of the wide applications of this sure-fire system. Some day, who knows, it might even turn up in the Pentagon Building in Washington, to teach people how to find their way around.

6

TO DO IT EASIER AND DO IT BETTER

The Job Management Program

JOB METHODS TRAINING, or JM as it is familiarly called, is a kind of midget course in scientific management. It is a stop watch humanized. It is time study at the grass roots.

As war production mushroomed, all kinds of new processes were developed, while old processes were drastically changed. Some methods were terrible. One industrial engineer put it: "You poured man-hours and materials in at the top, and they didn't come out at the bottom."

A firm of efficiency experts might help, but there were not enough firms and not enough time. What could be done? Could foremen be trained to look at their familiar surroundings with new eyes? Could they learn to take the questioning attitude toward everything in their own departments, with a view to improving the *little* things? Here is a little thing, for instance. A six-foot man leaves his bench in an aircraft factory and goes into the army.

To Do It Easier and Better

A girl, four feet eleven, takes his place. The height of the bench remains unchanged. The little girl does her best, but her back is slowly breaking while her movements are cramped and clumsy. Production goes way down.

Job Methods was one answer to the little things, even as Labor-Management Production Committees were another. Experience has shown it to be a real answer. Already more than 194,000 supervisors have taken the program, and more are getting their certificates at the rate of 3,000 to 3,500 a week. Each supervisor brings at least one problem from his own shop to be solved in the conference, and goes back with the solution. This amounts to a regular prairie fire already burning at the grass roots.

In the Job Methods course a dozen foremen meet for five sessions of two hours each with a trainer or leader. The school atmosphere is carefully avoided; the pattern is rather that of business men in conference. The properties are a reasonably quiet conference room, a blackboard, a small card with the highlights of the program printed on it, and a will to open up one's mind and think new thoughts. Just as in the case of JR and JI.

THE RADIO SHIELD CASE

The leader begins by saying that he is going to demonstrate how an actual job in a war plant was analyzed. "The principles used on this job," he says, "apply to all types of work. I'm not an expert in your business, but I have used this plan on my own job and I know how well it works. Now watch me carefully, and think of what I am doing in terms of your own department.

"There's a company in New Jersey," the leader con-

Men at Work

tinues, "which makes radio shields. A radio shield is a 5x8 sheet of copper, riveted to a sheet of brass of the same size. The operator's job is to take a sheet of each metal from a pile, inspect them for flaws, fit them together, rivet, stamp and weigh them, and leave them for the handler to pick up.

"Now here is the way it used to be done. I can't use real metal, so I have these cardboard sheets. The red ones are copper and the yellow ones are brass." He holds them up for the foremen to see. "Instead of a real riveting machine we will use this office stapler." He holds it up. "The operator sits here, with the machine in front of him. The brass sheets are piled over here, and the copper sheets over there."

The leader then goes through the whole process in pantomime. He shows how the operator gets off his stool and goes and gets twelve copper sheets from one place and walks back. He gets twelve brass sheets from another place and walks back. Then he fits them laboriously together in pairs, throwing out the damaged ones. Then he puts them in the machine, and sometimes his hand slips and he spoils a shield. When he has a stack of finished shields in a tote box, he carries the heavy box half across the room to a scale and weighs it. Then he starts all over again.

This job, the leader points out, involves the three chief elements of factory work—handling materials, machine work, hand work. "Now let's look at a better method for doing the job, one which will save materials, improve machine use, save man-hours. I'm going to show you how radio shields were made after the foreman in charge had

To Do It Easier and Better

got wise to Job Methods. Think of these improvements in terms of your own job."

Behold the transformation!—again carried through in pantomime. The metal sheets are delivered by the handler direct to the operator's bench, so he no longer has to wander across the room for them. Two riveting machines are installed so that the operator can use both hands. A jig is set up in front of the machines. It holds the sheets exactly aligned, so that they cannot be riveted askew and spoil good metal. There is a chute through which to drop imperfect sheets. The finished shields are packed right into their final box at the bench, where the handler takes them off for weighing, stenciling, and shipping. The operator need never move from his seat. Everything is under his hand. The flow of materials is smooth and direct.

To watch a good JM trainer put on this show is dramatic, compelling, and even funny in spots. A particularly effective bit is where the operator is required to speed up his work under the old method. The faster he runs around the room the more material he spoils, the more things he drops, and the closer he comes to injuring his hand in the machine.

Finally, the leader points out that the new method, with no speed-up and with far more comfort, produces three times as many radio shields a day per operator. Each machine rivets 50 per cent more shields a day. Scrap losses are cut from 15 per cent to 2 per cent. With the dramatic before-and-after demonstration in front of us, we can well believe it.

How was the improved method developed? The leader invites the group to look at the small card each of them

Men at Work

holds. The card lists four steps, applying not only to radio shields, but to any job, anywhere, involving manpower or machines or materials, or any combination thereof.

The *first step* is to break down the job, listing on paper *all* the details exactly as done by the old method. The radio shield maker had thirty separate things to do.

The *second step* is to query every one of these details with a kind of machine-gun burst of questions: *Why* is this necessary? *What* is its purpose? *Where* should it be done? *When* should it be done? *Who* is best qualified to do it? *How* is the best way to do it?

The *third step* is to develop the new method. Take the job breakdown and eliminate unnecessary details, combine, rearrange, simplify. Call key workers in for suggestions. Let both hands do useful work wherever possible. Let jigs and fixtures take the place of hands for holding work. In the radio case the number of operations was cut from thirty to fourteen.

The *fourth and last step* is to sell the idea to all the workers who are going to use it, and to the man higher up. This is just as important as developing the method. Get final approval from all concerned on safety, quality, quantity, and cost. Then put the plan into operation, giving full credit to all who contributed.

When the foremen have mastered the principles of the radio case, the trainer asks each man to bring into the conference room a case hot off the griddle from his own department. One by one, these are put through the four-step analysis. Excitement grows as the group chalks up saved minutes, saved machine work, saved copper, aluminum, steel. Sometimes the excitement is even more intense. Out

To Do It Easier and Better

in Portland, Oregon, a JM program evolved a secret war weapon which the Navy is now using constantly!

"THEY WANT YOU TO THINK"

I talked to the chief supervisor of the packing department of a large war plant in Connecticut, a big, round-faced man, going a little bald, kindly, human, and tough as a nut.

"Yes, sir, I don't know what we'd have done around here without JM. This department has been like the inside of a mixing machine ever since the war began. Every day the War Department wants things packed differently. I used to be kind of set in my ways, but you can't fight a war like that.

"I've got twenty-four foremen under me and they have all taken the program. It puts them on their toes. One of them said the other day: 'I can see things now I never saw before,' and then he went up to his desk and worked out a honey of a method for packing heavy stuff.

"They want you to *think* now, and that releases a lot of live steam. Before the war it was kind of dangerous to think. The boss higher up didn't like thoughts coming from lower down—reflected on him. So many of us kept our ideas wrapped in cellophane. Pretty soon they dried up altogether. Ideas now are flying all over the place. I tell you it's good to work in an atmosphere where people are giving things out instead of bottling them up."

"What do the workers think about JM?" I asked.

"They were suspicious at first, remembering the stop-watch boys and the speed-ups. You can't blame them; we'd act the same way in their place. But you notice that

Men at Work

one of the key points on the little card is to work out the improved method with the workers. We go over every new plan with them, ask them to make suggestions, get them in on it. The more they feel it is their plan the better it clicks. We don't have any trouble now."

"How about after the war?"

"You've got me there. I just don't know. If the country drops back into a depression with not enough orders and too many workers, all this fine drive for saving labor and materials won't make so much sense. I guess the only answer is not to drop back."

"Do you have any other reservations about the TWI programs?" I asked.

He thought a minute. "None of them are worth a damn unless top management takes a real interest in them, keeps pushing them. The head office must take them seriously if the supervisors are going to. There's no trouble about that in this plant, for the old man is completely sold; but I've heard that in some companies the programs peter out after a while, because top management is thinking of something else. We're so interested around here that we take before-and-after movies. Would you like to see some?"

I said that I would. He had a little projection camera brought in and proceeded to run off a picture of how a group of girls inspecting ammunition were sickened by lead dust, and how after a JM study was made, the dust was drawn harmlessly away.

I saw another picture of a girl collating pages for an office report by running all around a big table on which the sheets were stacked. After a JM study, they had her comfortably seated in front of a *vertical* rack with the pages all in front of her. When she got them collated, she

To Do It Easier and Better

pressed a lever with her foot which operated a stapling machine. The equipment, all home made, cut the time of the operation in half. There was no speed-up; indeed the contrary, for the girl was now in a chair instead of on her feet.

I saw a picture of loading shells a new way; a picture of a remarkable control device worked out for an annealing furnace which gave constant heat; a wonderful improvement in machine gun belt loading; a way to fix the brakes of a Diesel locomotive which was safer than the old way and took only a third as much time.

I saw a dozen such movies, first showing the inefficient, often dangerous old way, and then the easier, safer new way. Foremen who have designed improvements get a lift out of seeing them on the screen, and other foremen are greatly stimulated.

I asked how many of the improvements proposed by foremen in their JM conferences were actually adopted. The figures for this Connecticut plant were impressive—1,249 ideas had been turned in so far, 463 of them were in operation, 263 had been discarded, the rest were pending.

In the Baldwin Locomotive works, 250 foremen had taken JM up to July, 1943. Nearly all of them had presented proposals, of which 65 per cent were in operation. Twenty-two JM suggestions in the Picatinny Arsenal up to April, 1943, showed a rate of saving of 438,000 man-hours per year. By extending these proposals to all United States arsenals it is figured that \$30,000,000 a year has been saved—a handsome profit for Uncle Sam, who has allotted less than \$6,000,000 to date for all TWI activities.

In the Fourth Service Command of the Army Service

Men at Work

Forces, 1,623 accepted proposals saved more than two million man-hours in one year, materials worth a third of a million dollars, with a total saving of \$1,700,000.

Analysis of thirty-one jobs improved by JM in a large company in Bridgeport shows a 122 per cent increase in production. In a California aircraft plant, of 195 proposals submitted, 193 have been adopted. A company in Albany has increased its employment of handicapped workers. In a Cleveland plant fifty-eight foremen took JM. They turned in sixty-three proposals. Only nine were rejected. Another Bridgeport company estimates that it is saving \$1,000,000 a year by virtue of improvements already adopted, while plenty more are coming up.

A married woman employee took the course at the Picatinny Arsenal and applied it to her job. When she got home at night she thought she would try it out on the housework. She took her card and sailed into the kitchen.

"I timed myself preparing dinner and clearing up after the meal. The average was fifty-five minutes. Then I listed all the details. I asked *Why* is this necessary, and the other *Whats*, *Whens*, and *How's*, as shown on Step 2. Then I tried eliminating, rearranging, and combining. By moving pots and pans to a cupboard under the sink, by placing the most frequently used table dishes in a cupboard above the sink, by building a little bin for the soap powder, and so on—I cut the average time to thirty-eight minutes, and I'm not through yet. Also, I'm starting JM on bed-making, cleaning, and other household tasks."

Job Methods has proved its worth in war plants all over the country and has been used in other places, such as hospitals and farms. It can be used, as we have seen,

To Do It Easier and Better

in the home. The program as given is the distilled essence of much that the scientific management people have discovered since the days of Frederick W. Taylor. But unlike the surveys of the professional time-study men, it is an inside job. *The foremen themselves work it out. And, most important of all, it is done in active co-operation with the rank and file.* The stop-watch methods were often imposed against the workers' violent, if unreasoning, opposition.

WORKERS ARE PEOPLE

"Management is the development of people and not the management of things." Job Methods, like Job Relations and Job Instruction, hews to this line. Workers are not hands; they are people, just as sensitive and as complicated as the boss. If this attitude were more widely held, many management difficulties would disappear.

Too many managers meanwhile tend to manage on the century-old assumption that the worker's chief motives are material ones, especially wages and hours. Such assumptions are dangerous, as the Hawthorne experiments proved.

The old generalizations about what makes efficiency, and what workers want, and why workers work, have been half true or untrue. Management has often been in a blind alley, while strife and misunderstanding have grown. The line of communication between manager and man has been blocked, primarily because the manager assumed the man was an economic machine.

The revolution in management lies right here. The TWI programs are built on the assumption that the man is not an economic machine but a man. Not until this

Men at Work

assumption is made and acted upon does the man really begin to work.

While Americans are fighting a war for democracy abroad, it has been pointedly suggested that Americans could also use more democracy at home. It is one of the war's ironies that these democratic methods are reaching many factories at last, not through idealistic reform, but through the sheer pressure of necessity.

7

SOME BUREAUCRATS ARE HUMAN

The Social Security Board in Wartime

THE SOCIAL SECURITY BOARD of the federal government conducts the biggest clerical job on earth. It has an account with 76 million Americans. In two years its work has increased 33 per cent, while its pay roll has declined from about 12,300 employees to 9,800.

Work done is measured by number of claims for old age benefits handled, new accounts issued, wage items posted, and so on. Working hours have increased, but the quality of the new help, taken on to replace the 4,000 trained workers transferred to the army and to other government agencies, has declined sharply. These changes about cancel each other out.

Broadly speaking, the Board is doing a third more work with a fifth less help and yet doing it more smoothly than before the war. This is a record to make any office mana-

Men at Work

ger expand his chest. What has happened here to thwart the devils of "bureaucracy"?

Three things explain it, in my opinion. First, the high quality of the staff, especially at the top. Second, the fact that the Board was organized to do an entirely new job—one that had never been done anywhere on such a scale—and so was compelled to use creative ingenuity. Third, the use of a work simplification program derived from Job Methods of the War Manpower Commission, in which *the rank and file of the organization play a large part*. This report is chiefly about the work simplification and how it is not only increasing over-all efficiency but making serious inroads on the bureaucratic mind.

The Social Security Act was passed in 1935. It provided unemployment insurance and old age and survivor benefits for all workers in industry and commerce. It also provided assistance in certain cases for dependent children, and for the blind. The Board carries out the provisions of the Act. It pays out the old age claims, but the states pay out the unemployment claims.

From its start the Board has had a good name for its efficiency and decency. In the first seven years of its existence it turned back \$24,000,000 to the Treasury—money appropriated for expenses but not spent. Its entire staff is drawn from the civil service, and has been a picked crew operating in new territory. British experts said our law would be impossible to administer. No organization, they said, could keep accounts for twenty-six million workers at the speed required.

Well, the 26 million have grown to 76 million, while the time spent in settling a claim has been cut from forty days in 1940 to twenty-three days in 1943, and is still go-

Some Bureaucrats

ing down. Contrary to the policy of some organizations, which try to find reasons why they should not pay claims, the Board makes an effort to pay any benefits that are legitimately owed.

The Board has worked closely with the International Business Machines Company in developing the most marvelous automatic recording machines in the world. They do everything but talk. Here again it was an advantage having to start from scratch, with no traditions. There is no finer mulch for red tape than a good, rich layer of tradition.

EMBARRASSING QUESTIONS

The Board had to be efficient to handle the load put on it by the Social Security Act. Some years ago it started a "Why Survey," designed to question its operating methods. Last year it snapped up Job Methods and streamlined it for office work. Every member of the staff is included, where the regular JM for industry stops with the supervisor. This is democracy with a vengeance, and it produces surprising results. I have been watching the results both in Washington and in Baltimore—where the machines are located. As in the JM program, a given job is broken down into its essential steps and then each step is subjected to a salvo of six questions:

Why is this necessary?	When should it be done?
What is its purpose?	Who should do it?
Where should it be done?	How is the best way?

I have spent a lot of time in offices, first and last, but never before have I found a whole outfit asking embarrassing questions about the efficiency of their own work. In

Men at Work

effect they are saying, "Does this thing we are doing make any sense? Isn't there a better, simpler way to do it?" Everyone becomes an efficiency engineer in embryo, time-studying himself. . . . If the Board had an office cat, I would expect to see her plotting the shortest route around the rat holes!

Here is a big technical reference room in Washington, with stack after stack of documents, court decisions and fat legal books. The supervisor has a dozen people under her—indexers, file clerks, stenographers. She has attended a meeting where Oscar Powell, the executive director of the Board, has enthusiastically explained the work simplification program, and she is prepared to have it tried out in her shop. But she has her fingers crossed. She feels that her workers already know about efficiency.

A big table is cleared, and the entire staff of the reference room take their places around it. They look a little dazed, especially the file clerks. In comes the "trainer," a specially chosen employee who has taken the JM course with the War Manpower Commission. He goes to the head of the table and unpacks his box of stage properties. Then he starts to put on a show—the classic "radio shield" case, with its before-and-after contrast.

Everyone around the table is fascinated. The trainer capitalizes this interest to drive home the application to their own work in the reference room. He shows how to break down any job into its essential steps, how to ask the six basic questions, how to develop a better way with fewer steps. Finally, he asks for volunteers to bring a breakdown of one of their tasks to the next meeting.

I talked to a girl who had been an early volunteer. Her task was to index certain documents coming in to the

Some Bureaucrats

reference room. She showed me the neat typewritten form on which the old way is compared with the new way. The first had eighteen steps, the second eleven. The old way took five hours, the improved way two. She was quite a pretty girl, and her face grew radiant as she showed me how she used to move in circles and now moved in straight lines. "I never realized before," she said, "that there could be a plan for thinking out improvements. Why, there is no end to what we can do now! I always thought the supervisor was supposed to do the planning. Now I feel it's part of all our jobs."

I crossed the room and asked a file clerk what plans he had evolved as a result of the round-table meetings. If I had stayed to hear him out, I should be there yet! He was a colored boy, and so excited by his discoveries that he could hardly get the words out fast enough. He used to vary his filing with operating the addressograph, and the wasted steps in a day ran into miles. Now he runs the addressograph in the morning and devotes the afternoon to sorting his material for filing. When he finally moves to the files, he goes like General Eisenhower, completely equipped, with everything prepared in advance. He saves hours a day by this organized attack.

In another office I found a plump, gray-haired, conscientious lady, obviously an office treasure—one of the kind you could trust with the U. S. Mint. For years she has been preparing an annual index of rulings, at a cost of 600 man-hours. (Perhaps we should say woman-hours.) Twenty-seven steps were involved. She has cut them to twelve, and she can now do the job in 200 hours, a saving of 400 hours or 67 per cent. Step by step, she showed me what has been eliminated.

Men at Work

"Why didn't you think of doing it before?"

"Because I was not supposed to think like that before. I was told how to do it and I did it. Also, there were rules higher up that forced us to take some of those unnecessary steps. When the breakdown showed how pointless they were, we got them changed."

When a plan is first submitted at the round-table, everybody is encouraged to take a crack at it, especially the supervisor. Many plans overlap other people's work and have to be ironed out by group discussion. A group of ten to twenty persons may need five or six meetings to discuss the proposals presented. So far, in the Washington office, *80 out of every 100 plans have been adopted*. Some show modest savings in time or materials, but others work out to very substantial figures.

As the meetings progress, the trainer eases himself out of the chairmanship, and the supervisor takes over. It is better that the supervisor should run the sessions, because one of the chief purposes of the round-table is to bring supervisor and worker closer together. The trainer stays as a consultant as long as he is needed.

Every suggestion for improvement is passed up the line to supervisors above. Top management acknowledges them by a personal letter. Without the active interest of top management, says Mr. Powell, the project would presently fade out. A record of the achievement gets into the individual's civil service file, so that any future employer will see it. There is no financial reward; nothing but credit, honor, and a satisfying sense of participation.

Some Bureaucrats

RESULTS

Work simplification has been operating long enough to warrant the following conclusions. If you have anything to do with an office, they ought to interest you.

1. The program taps a vast reservoir of human energy which lies inert in most offices.

2. It helps the employee to share in management and to understand the importance of his job. His morale goes up.

3. It stimulates orderly thinking through the job breakdown technique and the six questions. It gives the employee an effective method for analyzing his own work. He can use it not only on this job but on any job, in the office or at home.

4. The program is democracy in action; it gets everyone in. It transforms the supervisor from a driver to a leader; from "do it and no back talk" to "let's see if we can work out a better way."

5. It opens up the horizon of the supervisor. The old attitude of feeling ashamed if employees beat one to suggestions for improvements, becomes a feeling of shame if employees do *not* submit a flow of suggestions to be passed up the line to top management.

6. It shows up red tape the way litmus paper shows up acid.

7. It turns up methods which can be applied in other offices and bureaus. A good suggestion in one of the field offices of the Board can forthwith be introduced in all the 400 field offices. That runs into important money for the taxpayers.

Men at Work

8. Work simplification as a technique is applicable to other government agencies, and to all office work which involves recurring tasks. In fact, *the round table idea is now being adopted by unemployment insurance offices in almost all the states, by the Department of Agriculture, by the State of Minnesota, by the City of New York.*

Here is an example of how the Board has used the program to get rid of several yards of red tape. "Red tape" can be defined as a situation where two people do the work of one, or where work is duplicated between departments. When the income tax authorities made it possible for you to sign a return without a notary public signing his name too, they abolished some red tape, though there is plenty left.

Jim White in the St. Paul office of the Board is being transferred to Boston. He is going to sell his house, take his family and his furniture with him. The Board is authorized to move his furniture for him, but to get it done under the old method was something like launching a battleship. Twenty-four signatures, acknowledgments, permits, and certifications were required, in three different geographical locations—St. Paul, Chicago, and Washington. Practically everybody up to the President had a hand in moving Jim.

Then came the new program and some pertinent and impertinent questions: "Why are you in this? And you? And you? What function, mister, do *you* serve?" As a result, the whole thing can now be done in St. Paul, without Chicago or Washington sticking their noses in at all. Jim can get his family established in Boston happily before he dies. The change sounds as easy as it is sensible, but

Some Bureaucrats

to make it the Board not only had to change some of its own rules, but had to get Congressional authority and collaboration of the Bureau of the Budget and the General Accounting Office.

Then there is the story of the clerk who asked why she should classify and file the *third* copy of social security decisions sent in by the states. About 4,000 decisions were received every month, some running to ten pages. Two copies were in the works, so why, the young lady inquired, file another one? Her superiors, horror-struck, could point to no answer except that they always had. They put Miss Q on other work and stopped saving the triplicate copy. Instead, they saved time, filing cabinets, floor space, paper, transportation, to say nothing of labor at the other end, now sending only two copies.

The Year Book has been cut from 368 pages to 220, and the Annual Report from 216 to 108. The simplifying of the weekly bulletin to field offices saved two tons of paper, while 25,000 lines of typing were done away with by abolishing a formal letter of acknowledgement. A clerk asked: "Why acknowledge something the sender knows we've got or we'd yell?"

Traditions fall, not only in Washington but in the larger Baltimore office. Old age and survivor benefits are calculated here on fearful and wonderful machines. I saw a whole building full of these clanking robots, automatically recording data from cards.

If you enter a certain aisle between high steel files and give a young lady your name, she can find you among the 76 million in about a minute. She does it not by letters but by *sound*. It took forty-eight seconds by my watch for

Men at Work

her to find "Stuart Chase." Indeed, to my considerable surprise, she found seven Stuart Chase's, or said she did. But alas, she did not find me, because I am self-employed and not yet eligible. Then I inquired for my daughter, who worked a year as a welder in an airplane factory, and was told that her career was perpetuated in those steely corridors, with a complete record of her status, earnings, and deductions. I even found her microfilmed.

Baltimore is not quite a factory and not quite an office. You might call it a place where records are mass-produced by high speed machinery, mainly on the Hollerith punch card principle. In such a setting it is difficult to give the round-table course to every individual, for a hundred girls may all be doing precisely the same thing. But it is possible to get every individual interested and to obtain helpful suggestions from a great many of them. In little more than a year, 2,400 workers had made 6,600 suggestions, of which 1,600 had been adopted and 525 were pending.

Some of the proposals have been spectacular. One of the building guards worked out a plan to eliminate thirty-eight guards, or half the force, with no loss of protection. Another employee has completed a plan for eliminating the seventy-six million ledger sheets altogether, with the essential information retained in simplified microfilm listings. This move promises to save \$350,000 a year and 20,000 square feet of floor space. The elimination of Form OA-702 has had even more astonishing results. It saves the labor of not less than 425 employees!

Some Bureaucrats

PLAIN TALK

Because I am a writer, I am specially interested in another reform. *The Board has begun to analyze its own talk.* It is asking: How can we report to the public more clearly? How can we take the static out of our internal communication line? "We in the central office have been censured for writing too much for ourselves or for one another. We are so accustomed to technical terms that we use them without realizing how few of our readers can be expected to understand them. We must take an entirely new slant at this job of writing." The new slant assumes that the person at the other end of the communication line knows nothing about the technical workings of the Board. It assumes that he is entirely dependent on the writer of the memorandum for accurate and complete facts.

Mr. Corson, head of the Baltimore office, has gone so far as to work out a kind of JM step card to which employees who want to communicate something of importance to their fellows can refer. The little card reminds them to keep sentences to twenty-five words, paragraphs to 100. (How have I been doing in this chapter?) It urges them to avoid technical and legal terms. Do not hedge, be explicit. Avoid conditional expressions, like "so far as possible," which can mean anything. Use friendly, not frigid, words. Do not be afraid of idiomatic words and phrases. In short, keep the communication line free. Concentrate on the *meaning* you want to send along it, and forget the \$64 verbal trimmings. This is indeed a revolution among bureaucrats!

Men at Work

The Board receives a good deal of fan-mail. Here is an authentic sample:

Blankville, Texas

Director
Social Security Board
Washington, D. C.

Dear Sir:

Despite the fact that I am usually resentful when I receive an inquiry from state or federal agencies, I welcomed your letter as I invariably do when I hear from your office, because your agency is organized along sensible lines and is consistently courteous and inclined to help the employer rather than harass him.

Respectfully yours,

X Y Z

(President of a local company)

It is fortunate that people are beginning to feel this way about the Board. The indications are that it is going to have more customers than even the Internal Revenue. When social security is extended to farmers, domestic servants, and the self-employed, as some day it will be, nearly every American will be a client. The more human the Board is, and the more efficient, the better for us all.

8

TEAMS, GROUPS, AND GANGS

A New Dimension for Democracy?

THE UNITED STATES is proverbially a nation of joiners, and therefore one of the most complex social structures on earth. Indeed, anthropologists who for years have been packing mosquito tents for equatorial Africa suddenly realize that they have overlooked an even richer field under their noses, because of the many lodges, clubs, and societies that adorn our land.

At the bottom of the social structure is the individual. On top is the whole community. In between are these proliferating groups, some little more than a mailing list, some charged with dynamite. The reader probably belongs to several himself—but it is doubtful whether he realizes their power.

Groups are either organized or spontaneous. The organized type can often be examined statistically. How many members? What are the dues? Who are the officers? How does the constitution read? Members never know all other members in large organizations, such as the Red

Men at Work

Cross, the Audubon Society, the Elks, the Chamber of Commerce.

Spontaneous groups, on the other hand, are more difficult to study and describe. They have few records, no formal dues. They are always face-to-face associations, without written rules, and their leaders usually arise naturally, instead of being elected. They grow, like Topsy.

The "gangs" of adolescent boys are the most obvious example. Nearly every male American has been a member of such a gang. They form spontaneously on both sides of the railroad tracks. Their leaders normally fight their way up from the ranks by sheer ability or fire power.

In my day I belonged to three such associations. One was the Newbury Street gang in Boston, which fought outlanders from beyond Columbus Avenue. One was a "lower-upper" class gang in a fashionable suburb. We did not do much fighting, but built secret huts in the woods, to which we repaired and smoked clay pipes. The excitement of getting out of a window after midnight, sliding down the gutter spout, and joining the gang after giving the password, was perhaps the wildest of my life. The third was a middle-class, drugstore, penny-ante gang, without much excitement but essential to one's unstable ego at sixteen.

Give such a gang a purpose and its power emerges. Some purposes cannot be achieved without this kind of collective power. A competent army, for instance, can only be built upon a foundation of squads of combat troops, who work together under natural leaders, with or without shoulder insignia. Team spirit in football is proverbial. A loose collection of individual strong men must coalesce into a higher organism moving as one man. If this does

Teams, Groups, and Gangs

not happen, the score is something to make alumni bite their coonskin coats and secrete their checkbooks.

Every large factory, department store, railroad yard, is a hive of informal groups. They can wreck a balance sheet or they can make output hum.

In studying group action, we are clearly dealing with one of the most dynamic, and least understood, of human activities. What is their portent for better relations in the whole community; for greater industrial output; for democracy itself? Recently some interesting studies have been made in this little-explored field.

A NEGATIVE GROUP AT HAWTHORNE

Dr. Elton Mayo of the Harvard Business School is perhaps our foremost student of industrial psychology. He knows more about why workers work and why they don't, than all the stop-watch men combined. He realizes how recent a thing a factory full of machines is, and how profoundly it differs from the normal pattern of unclocked work-play which mankind has followed for 100,000 years. "At no time since the industrial revolution," he says, "has there been . . . anything of the nature of effective and wholehearted collaboration between the administration and the working groups of industry."

A great river of human energy has been running to waste. Workers have fixed concepts about management which are normally false to facts. Managers have fixed concepts about workers which are normally false to facts. If the work situation in a given plant is different from what management assumes it to be, then management does not

Men at Work

know what is going on in the plant, and cannot really manage it.

One of the most complete studies yet made of an informal group was carried out in the bank wiring room of the Hawthorne plant of the Western Electric Company in the 1930's.* It validates the above conclusion, and Dr. Mayo had a hand in it.

There were fourteen men in the room, and their job was to attach the wires to switches for telephone office equipment. Nine men were wirers, three were solderers, two were inspectors. Looking at them again, four were Czechs, three were Yankees, three were Germans, two were Poles, one was Irish, and one was Armenian. . . . A fair sample of factory workers in the Chicago area.

These men had spontaneously formed a team, and leaders had made their way up. Management was unaware of the strength and toughness of this outfit. It was a social outfit, not primarily an economic one. It was not opposed to management but comparatively indifferent to it, having more interesting matters to attend to.

The company had laid down a plan for incentive pay whereby the more a worker turned out, the more he earned. It was a fair plan, and management assumed it would help production. In the bank wiring room it did nothing of the kind. If anything, it harmed production. The fourteen men in the room could readily have turned out 7,300 connections a day without fatigue. They would have earned more money had they done so. But the room held to a flat 6,000 units per day, no more, no less. This was the "bogey" above which the incentive system began

* We have already observed the girls in the Relay Room. See Roethlisberger and Dickson: *Management and the Worker*.

Teams, Groups, and Gangs

to operate. If some member got ambitious, the gang slapped him down. There was no relation between a member's output and his ability. They did *not* act in accordance with their real economic interests. Why?

Because they were more interested in maintaining their team than in cash returns. Also, their folklore taught that if they exceeded the bogey, four calamities might descend upon them:

1. The piece rate would be cut.
2. The bogey would be raised.
3. One or more of the team would be fired.
4. The supervisor would bawl out slower members.

The management assumed that each individual employee would act with a logical response to their incentive pay plan. These employees did not do so. "This was a result which neither the plan nor the management was prepared to cope with. Any management which leaves out the feelings, sentiments, folklore, of the workers, is incomplete and incalculable." The whole plant at Hawthorne was found crawling with similar informal groups, lined up against "rate busters"—who produced too much, "chiselers"—who produced too little, and "squealers"—who told on group members.

The stop-watch men, consciously or unconsciously, frequently try to break up groups, hoping thereby to make workers more efficient. This often results in depriving workers of those very things which give meaning to work, and without which the most efficient service can never be drawn out of them. An assembly line can force an employee to operate alone, to be sure, his only buddy the relentless mechanism of the belt. It can speed him up to a high tempo, but not to his best work.

Men at Work

In the light of this study of the bank wiring room at Hawthorne, it would appear unwise to break up groups, or to make plans as if groups, or the need to form groups, did not exist. They must be recognized, understood, and worked with.

AIRCRAFT WORKERS

More recently, teams of research men from the Harvard Business School, Dr. Mayo assisting, have been studying aircraft plants in California. They found that miracles of production were being achieved in spurts, but that overall performance left a good deal to be desired. Labor turnover and absenteeism were very high. In 1943 turnover was such that of ten workers at their benches in January, only three were left in November. Even if the incoming seven were alert and experienced—which they were not—there would still be a loss of output as they were broken in. Worse would be the loss as old teams were fractured and new teams gradually formed.

Much of the turnover could not be helped. Conscription was going great guns in 1943; women, youngsters, oldsters were experimenting with war jobs which they did not need financially and did not always like. An abnormally large number of Americans were on the move in 1943, and nowhere did they move faster than in the Golden State. Southern California was presently making 50 times as many airplanes as in 1941. As the manager of one plant put it: "This isn't a mushroom growth; it's an explosion!"

The Mayo report makes full allowance for these difficulties. Turnover was bound to be abnormal, even with the best of management. But management was often short-

Teams, Groups, and Gangs

sighted. When good technicians were drafted, management keenly felt their loss. When natural team leaders were drafted, management hardly noticed. Yet their effect on production was often greater than that of the technicians.

Here is a typical case which illustrates the point. John Briggs is a team leader in Department X. Nobody appointed him; he just is. Every worker in that end of the department knows it.

John goes to his supervisor with a complaint. The supervisor looks John up and down, walks over to the file, and pulls out a card. "Do you want your certificate of availability?" he snaps. John had no thought of leaving. He knows, however, that Lockheed needs men badly. He snatches his certificate and walks out, white with anger.

He has not told his supervisor what he came to complain about. Maybe it was the light, maybe the washroom. He has not told him that it was his bench-mates who asked him to complain. So a team leader is lost, who the management did not even know existed. John Briggs was a man who was building up production by molding a loose collection of individuals into an industrial football team. He was raising morale in his end of the shop, and was in a position to relieve the foreman of many problems of minor discipline. He was beginning to make things hum. And now he is walking out of the gate, cursing the supervisor and the company. The team is headless, and will dissolve into its separate unco-ordinated units. In the front office the chart makers wonder why output in Department X has gone to hell.

The Mayo people saw something very much like this happen. It does not always happen. Sometimes a wise fore-

Men at Work

man or an exit interviewer recognizes the cardinal place of John Briggs in plant production, and gets him back to lead the team. Frequently, however, the exit interview, made when a man is leaving, comes too late.

There is only one sure way to save team leaders. That is for top management to recognize that they are often the powerhouse of the plant.

It is useless, says Dr. Mayo, for management to try and decide whether or not to have groups in the factory. They will form anyway, whatever you do. They are as natural as falling in love. Management may be able to control their attitude, whether friendly to the company or hostile. It may be able to overcome that suspicion of co-operation with management, which unfortunately is the usual attitude. Managers may sometimes choose which type of group is to be formed.

Dr. Mayo found three types in the aircraft factories studied:

1. A "natural" team, with rarely more than seven members, having closely related tasks.
2. A "family" group, with as many as thirty members, where a core of experienced workers guided the newcomers and the less experienced.
3. An "organized" or company group, deliberately set up by the management to capitalize the team instinct. This can be even larger than the "family" type. It cannot be set up in a hurry, but requires at least six months to establish.

When all the above are accounted for, there will remain the "irregulars," the men who can't or won't make the club. An intelligent, "organized" group will try to get in as many of these as possible. The greater part of

Teams, Groups, and Gangs

absenteeism and turnover comes from the ranks of irregulars and unrelated individuals. They have found no social life in the factory, and so nothing to hold their loyalty.

THE PRIZE TEAM

One of the Number 3 groups was discovered statistically by the Mayo people. The research men were plotting curves covering rates of absence. When the curves were abnormally high or abnormally low, further investigation was made. A curve turned up which was a honey. Most of the workers in that department were in the class of one absence a year or *less!* Investigation showed that "the assiduity of attendance . . . was such that on numerous occasions employees had come to work so ill that they had to be sent home." A regular bunch of teacher's pets! What was the matter with them?

The matter was that a rank and file supervisor had mastered the team idea and organized a gang, with himself as lead man. He was a college-trained chap with a good deal of industrial experience and a knack for handling men. He acted as trouble shooter, contact man in the relations of his group with higher-ups and with outsiders, as host to new workers, and as general guide, instructor, and father confessor to everyone on the team. Top management was unaware of the whole thing.

He took especial care in starting a new man off on the right foot, with a long friendly interview, a warm introduction to his future buddies in the department, and a tour of the plant, particularly the assembly line, so that the newcomer could see exactly where his work fitted in to the

Men at Work

completed battle plane. Often the newcomer watched a part he had helped to make being installed in the final assembly. He knew his country needed him then!

Group members brought their troubles to the leadman—factory troubles, home troubles, girl friend troubles. When they thought they deserved a raise, they persuaded him to ask the boss for it. They worked hard because they felt good about working. Their efficiency was rated 100 to 105. The plant average was 80.

The Mayo people also ran into the type of manager who did not believe in teamwork. He was afraid of it. He preferred to deal with his workers one by one and distrusted any tendency to form cliques. The teams formed, of course, and were mostly hostile. Plenty of irregulars were left over to send absenteeism and turn-over rates sky-high. Supervisory troubles increased, because irregulars do not discipline themselves as do team members.

These Pacific factories were not old-fashioned companies, remember. They were new, mostly open-minded, and strictly up to the minute in technology. They were very willing to co-operate with Dr. Mayo's men. They had fancy personnel programs, with athletic fields, recreation halls, day nurseries . . . "everything but bull-fights." Without such programs, turnover and absenteeism would doubtless have been still higher. Managers had every aid modern science and social work could bring them, except the knowledge of what makes men work. Failing that, the army did not always get the battle planes it needed.

Teams, Groups, and Gangs

GROUP DYNAMICS

Now let us look at Dr. Kurt Lewin's studies in teamwork, or what he calls "group dynamics." Is the impulse essentially democratic? If not, can it be made so? Dr. Lewin's keen interest in democracy was helped along by what he saw developing in Germany. He came to the U. S. in 1932, and has been associated with Cornell, Stanford, Harvard, the National Research Council, the Bureau of Agricultural Economics, Massachusetts Institute of Technology. His chief experiments in group dynamics were made under the auspices of the University of Iowa.

Dr. Lewin uses the operational approach of the physicist in conducting an experiment. A group exists. Let us not talk about it, but observe it, measure it. How does it operate, what can it *do*? A Boy Scout troop, a class in school, a booster club, are just as much grist to his mill as a factory group. He sets a problem for the group to solve, observes it in action, and records the results. The function of leadership interests him especially.

PLAYGROUND LEADERS

Des Moines offers organized recreation to its children in the summertime when they are not in school. Six playground leaders were not doing a good job. Dr. Lewin and his associates undertook to discover why, and soon found out that the trouble was dictatorship. "You play as I tell you to play, or else . . ."

A three weeks' retraining period was inaugurated, in which the children were invited to take more responsi-

Men at Work

bility. The invitation was warmly accepted. Games and handicrafts were worked out as a team, with the playground leaders as co-operators, not as czars.

The results were striking. As they took more responsibility, the youngsters began to discipline themselves. The erstwhile "bad" leaders were able to relax, instead of wearing out their biceps and vocal cords in a losing battle to enforce discipline. Everybody had more fun. Changing the group from an autocratic to a democratic form vastly improved its functioning.

SEWING MACHINES

In a certain factory stood a battery of sewing machines. Each machine had its worker, and over them was a woman supervisor. When a machine broke down, a maintenance man was assigned to repair it. Between him and the supervisor a first-class feud developed. Again and again the manager of the factory effected a temporary reconciliation, but it was short-lived.

Finally, the breaking point came. This man and woman could not very well shoot it out, so they put on their coats and started to walk out in a double quitting act. In desperation, the manager called in a psychologist—an associate of Dr. Lewin's who happened to be making some studies that day in the factory. The feudists were rounded up and agreed to hear what he had to say.

In a single afternoon this remarkable psychologist resolved the conflict *so that it stayed solved*. He took the hate out of them. How did he do it?

He began operations in a pretty murky atmosphere.

"She's too darned bossy. . . ."

Teams, Groups, and Gangs

"He called me a liar. . . ."

"Sadie said that you said that he said . . ."

He got between these verbal missiles and stopped the flow with a few sympathetic remarks. Then he arranged to talk to each separately, at their own place of work. This forced them to take off their coats, walk to their posts, and cool off while waiting for him. In the two interviews he extracted the following facts:

Paulson, the maintenance man, had 160 sewing machines to look after. It was far too many. Sometimes he was called for two or three simultaneous breakdowns. Having only ten fingers, he let operators kick their heels while he was repairing other machines. They lost money as well as time, and complained to Miss Sulinda, the supervisor. She promptly began to berate Paulson. Both parties agreed on one thing: there was a group of girls who were "trouble-makers."

The psychologist has located his informal gang. Also a way is opened to release pressure on the main front by shifting blame to a third party—the trouble-makers. May he interview some of them? He promises to report back to Miss Sulinda just what he finds. This appeals to the lady's sense of importance and further calms her down.

The "trouble-makers" prove to be energetic girls with above average intelligence and nervous tension. They corroborate the fact that Paulson is overworked. The psychologist asks how, in fairness to them, routing of repair work can be improved? The question catches the girls' interest, and the team goes to work on it. They agree they have nothing against Paulson. They say some machines are more important than others and should have priority. They suggest that Miss Sulinda be the judge of priorities.

Men at Work

This simple procedure solves all aspects of the problem. The psychologist has acted as a kind of traffic cop, getting the "trouble-makers," the supervisor, and the repair man all to agree on a set of stop-and-go signals. The solution, observe, is not imposed from above, but evolved, after discussion, from key persons among the rank and file. It is a great help, says Dr. Lewin in writing up the case, "to have the lowest group in the hierarchy of the factory do the first step of planning a change."

Three months later Paulson reported that he was getting a third fewer calls, and found the girls better tempered and less fussy about trivial repairs. They operated their machines more smoothly, with fewer breakdowns. Meanwhile, he had made a substantial hit all round by presenting the shop with a loud-speaker system which he had made himself, and some lively records. He had no more battles with Miss Sulinda.

The output rate of the department, after a group decision, rose from seventy-five units to eighty-seven, and was staying at eighty-seven. The psychologist—whose name was Bavelas—had certainly done a good afternoon's work.

COLLEGE BOYS AND BREAD

At Iowa, Dr. Lewin studied eight groups of college boys, each with its own co-operative dining room. In pursuit of his group dynamics, he proposed, as a test, that they eat more whole wheat bread. This was at a time early in the war when the government was placing great emphasis on improved diets, as well as on food production. To change food habits, however, involves many factors of family background, custom, individual taste, physiology.

Teams, Groups, and Gangs

Four groups were asked to change. There was of course no compulsion anywhere in the experiment by college authorities. The boys raised very little objection, but they ate very little more whole wheat. They simply failed to comply with the request.

The other four groups *voted on the matter*. This made it a group decision. Three of the four proceeded to eat a lot more whole wheat after discussion and vote.

But in the last group a curious and significant thing happened. By a very close vote it was decided to swear off white bread entirely. This Spartan course was not contemplated in the experiment, but was put over by enthusiastic reformers. The result was not only that the pledge was broken but resentment was high in the dining room. A supposedly democratic method had been used in an undemocratic way, and the boomerang was serious!

The experiment indicated two conclusions. First, a decision by the group itself is usually far more effective than a request from outside. This is confirmed by many other cases. Second, "if the group decision is based upon too small a majority, there is danger of a 'kick-back' which seems to make the outcome even less favorable than that of the request method." Not only was the majority small; it was also guilty of high-pressure tactics.

"We are moving," says Dr. Lewin, "toward a full-fledged experimental science of group dynamics which will include problems of leadership . . . group morale and group production, discipline and group organization. . . ."

As the experiments progress, it becomes clearer that the techniques of human relations are concrete and meas-

Men at Work

urable. They are not pills, however, to be swallowed with the expectation of instantaneous cures. They require patience, wisdom, and continuous follow-up.

In a factory, for instance, hiring personnel directors is not enough. Installing foreman-training courses is not enough; labor-management committees are not enough. These are all good methods, which have worked well in various instances. They are feeble things, however, unless top management is active in making them work.

Not only should the big boss take a direct personal interest in these matters; he should establish a free and fast communication line from the lowliest worker right up to his own desk. Above all, in order to get that whole-hearted collaboration between management and worker which our experts call for, the boss must understand the vast human dynamo involved in teamwork. If he can enlist its aid, the increase in both morale and output is well-nigh unlimited.

9

FROM THE LOWER DEPTHS

The Story of One Hundred Sharecroppers

AT CAIRO, ILLINOIS, a great steel bridge leaps across the Mississippi to the Missouri shore. If you drive across that bridge and turn southward, you come into a country which has been christened "Swampeast Missouri." It was once a flood plain covered with gigantic oak, cypress, and gum. The timber companies finished off the trees long ago. Army engineers came in with a maze of levees; drainage companies came in with a maze of bonds (now defaulted); and Old Man River was pushed out of his natural flood control reservoir. In the 90's farmers came in from northern Missouri and Illinois, and between the rotting stumps wheat and corn began to grow. There were mud and malaria, but the soil was incredibly rich; and in due time this addition to the corn belt became prosperous.

Suddenly, in 1923, cotton planters—pushed north from Arkansas by the boll weevil—captured the region in a one-year blitzkrieg. Cotton brings its human culture with it—sharecroppers and day laborers to "chop" the cotton in

Men at Work

the summer, pick it in the fall, and rot slowly most of the remaining months.

The sharecropper gets a shack, a line of credit or "furnish" from the land owner, and perhaps a 50 per cent share in the cotton his family helps him harvest. When accounts are settled in December, he is fortunate if he has \$50 to see the family through the winter. Usually he borrows against the next crop. He is charged high prices at the store where he must trade and high fees at the cotton gin. He can look forward confidently to "an endless cycle of debt, drudgery, poverty, and insecurity." Despite frequent exhortations in the metropolitan press, this way of life does not improve his character.

The position of the sharecropper, however, is opulent compared with that of the farm laborer. The laborer has no shack provided for him, no fields to tend, no "furnish." He and his family are supposed to live without eating for eight months in the year. But it is very important that he present himself at the right seasons, in suitable numbers and reasonable health, to help croppers and owner chop and pick the cotton for a dollar a day, more or less. This done, he can go back and live on air again.

In the depression, with cotton at five cents a pound, planters were almost as hard hit as their workers. Many went to the wall. The survivors, to cut costs, substituted tractors for mules and manpower. So thousands of sharecroppers lost even that lowly status and went to the bottom. They joined the farm laborers, and presently went out upon the highways in a spectacular strike to demonstrate their utter wretchedness to the passing world.

Here they are in 1937, hordes of ragged, sick, and hope-

From the Lower Depths

less people, wandering over a land which nature has blessed with vast fertility. One cannot blame the planters, the bankers, the ginners. The world no longer wanted American cotton at the old rate, and the system to which they, too, were slaves was breaking up.

In the heart of Swampy Missouri is New Madrid County—flat as your hand except where the levees make low, endless hills. The fields of dark earth stretch away like the sea, marked here and there by a solitary veteran of the old forest. There are grain elevators, cotton gins, a few fine farm houses set amid their silos, and uncounted wretched shacks. Ninety-two per cent of the farmers in the county do not own the land they work.

In 1937 La Forge, New Madrid County, has an even 100 families, croppers and laborers both, trying to exist on the land. Sixty families are white, forty are Negro. They bear old Anglo-Saxon names—Fowler, Taylor, King, Wilson—and many of them are illiterate. Social and co-operative activities are unknown, opportunities for self-improvement non-existent. Bread with beans and water is their frequent fare, and for variety, sow belly, corn pone, and water. Milk for the children is a luxury. They have almost no medical or dental care.

They are suffering from malaria, pellagra, and malnutrition. Children stay home from the poor schools because they have no shoes, no coats, no dresses. After selling their 1937 crops, only ten families have any cash left; thirty are in debt even before the new year begins.

The region is one of the critical areas where the Farm Security Administration is trying to get farmers on their feet again. Officials from the FSA look at the land, the

Men at Work

100 families, and the titles. The federal government buys the land from the absentee owners, over ten square miles of it.

THE EXPERIMENT STARTS

It is the spring of 1938. The La Forge resettlement project is organized. The FSA has conducted many resettlement projects, but this is the first time that the families to live on them are taken absolutely as they lie, without selective tests. If these people from the bottom strata, white and colored, can be pulled out, anybody can be pulled out. A door will be opened for poor farmers the nation over—millions of them.

To begin its experiment, the FSA had 6,700 acres of rich black soil, a cotton gin, 100 tumble-down shacks, 100 desperate families. It also had money voted by Congress. And it had a man, Hans Baasch. Born in Denmark, he knew how poverty-stricken Danish peasants had fought their way up to sturdy agricultural independence. It took a generation or more to do it. The driving forces were the Danish folk schools and the co-operative movement.

As manager of La Forge, Baasch gave it everything he had—vision, patience, deep understanding of human nature, and the technical ability of an experienced farmer. Without Hans Baasch the story might have been different. If we need hundreds of La Forge's to answer the problem of the sharecropper, we shall have to find scores of men like him.

La Forge was way below par in food, shelter, clothing, education, health. The FSA could take the cash Congress had voted and *buy* the community up to par. But instead of just giving La Forge a handout of government money,

From the Lower Depths

the FSA wanted to make the people themselves produce a decent living standard. Then they must hold that standard through their own efforts. Finally, they must pay back money advanced to get them started. This was to be a real honest-to-God experiment.

Cotton culture breeds a kind of serf mind which has no hope and takes no responsibility or initiative. How would these people know what to do if there were no "boss man" to tell them? But Baasch remembered the beaten peasants of Denmark and set his face more resolutely to the task.

HOUSING

The first job was to build homes fit for human beings but not too costly for the land to support. The FSA engineers built ninety-four houses in 100 days, at an average cost of \$1,100. There were no dining alcoves, no gimcracks, not even running water. They got right down to the bare essentials of decent shelter, using mass production methods in which the La Forge men did most of the work with a few skilled supervisors and carpenters.

Lumber was unloaded from freight cars in an open field and cut to standard sizes by power saws. The units were then put in prepared jigs and nailed into sections—wall sections, roof trusses, partitions. The sections were taken to the site, where concrete posts had already been sunk by another crew of local men. In a few hours the house was up, shining in its new white paint.

Let us follow Jim McBride into his house three years later. Jim, in blue overalls, has been plowing. He takes us through a screened porch into an ample living room with tight, screened windows and a double floor. There

Men at Work

is a good heating stove, a couch, chairs, table, a carpet on the floor, and curtains in the windows. Beyond is a roomy kitchen with enameled sink, built-in cabinets, and a cook stove burning wood or coal. Wood may be had for the cutting, over beyond the levee. Sitting beside this stove in February, 1941, I had the following meal: hamburg steak with onions, gravy, hot biscuits, butter, string beans, spinach, plum jelly, salad, baby pickles, preserved peaches, coffee. Everything but the coffee, sugar, salt, had come off the place, fresh or canned the previous fall. Two bedrooms open from the living room; they are furnished with double beds, a dresser, mirror and chairs. There are closets, so that clothes are no longer piled on the floor.

Afterward I went into a typical sharecropper's house outside the project. One end of the porch had collapsed. The chimney was leaning crazily; the roof leaked through rotted shingles. Inside were a kitchen and a bedroom. Broken windowpanes were stuffed with old socks, walls were hung with newspapers and wrapping paper. The cold wind came through floor boards, windows, doors, walls. The privy gave one the horrors. In hovels like this most of the La Forge community had lived all their lives and tried to bring up their children.

With each of the new houses went a trim, white-painted barn, a stout concrete food storage vault banked with sod, a sanitary privy, a sealed well and pump, and fencing for all the fields. The whole layout cost about \$2,000—an all-time low for farm construction. This figure includes wages paid to the community members while they were building their homes. Adding the cost of the land, each farm unit represented an investment by the Government of about \$5,500. They were leased to the members at an average

From the Lower Depths

annual rental of \$220. The 6,700 acres were divided into 100 farm units, equalizing soil fertility as far as possible. People mostly remained where they had lived before, the Negroes in one area, the whites in another. Investment and equipment are identical.

CROPS

A crop plan for each family was worked out—so many acres in cotton, so many in soybeans, lespedeza, corn, vegetable gardens. The policy was to reduce acreage in soil-depleting crops like cotton and wheat. The land itself was to be brought back to a self-sustaining basis, as well as the people. Also, the program made members eligible for AAA soil conservation payments. Some families began to plant gardens before they moved in. Under the old system they seldom kept gardens, because they had no relation to the land. Nearly every year they moved to another tumble-down shack on another cotton field, rootless and uninterested. Now this fine new barn and house were *theirs*, as long as they met their commitments. These were *their* fields, as long as they kept them fertile. Of course, they began to make gardens. A fine place needs a fine garden. It needs flowers too. A sharecropper growing roses—inconceivable! But I have seen the rose bushes.

Farms cannot be cultivated, however, with bare hands. A sharecropper or a laborer has no tools. They belong to the boss man. So each family was loaned an average of \$1,300 by the FSA, on a five-year note at 5 per cent interest. With the money most of them bought first a team of horses or mules. Uncle Jim, a Negro, could scarcely believe his eyes when two fine mares began stomping in his

Men at Work

barn. He and his wife lay awake the night through, windows open, to make sure that the team was all right. Other farmers bought a cow, brood sows, chickens, and necessary farm equipment. They clubbed together in groups and bought grain drills, mowers, stalk cutters, disc harrows.

Now they are ready to go to work—Pa, Ma, and the older children. Ma's special task is to tend the garden and fill the storage vault with enough canned vegetables to last the winter through. The children for the first time in their lives are to have foods rich in vitamins the year around.

Everyone falls to. The FSA crop experts are on hand to help with advice about new methods. The flat, black fields are plowed and planted. There are chickens to feed, fruit trees to set out, cows to milk, cotton to chop or pick.

What does the land yield now? The before-and-after story of the whole project is impressive. Cotton acreage has been cut in half, wheat to a fifth. Acreage planted to hay and legumes has multiplied ten times. Where there were six acres of truck garden there are now sixty. To feed 115 head of cattle (a fourfold increase) there are now 1,270 acres of pasturage instead of seventy. There are twice as many horses and mules, eight times as many chickens, sixteen times as many hogs. In a typical family, Ma has laid down 450 quarts of vegetables in the storage vault, together with canned meat and lard. Even a layman can see what this means in soil conservation and food for home consumption.

Before the first year is out, ample food has been added to decent shelter. Members have, however, gone into debt to the Government. How will they meet their obligations?

From the Lower Depths

Heretofore they have lived in a squirrel cage of debt. Said one of them: "I wanted to leave the county many times, but I never could get money ahead."

CO-OPERATION

Can they get ahead this time? They see a chance to break out of the squirrel cage. They must work hard for it, but for the first time in their lives the chance is there. They have two main sources of cash income: sales of cotton, and AAA payments. How shall they get the best return for their cotton? Baasch remembers Denmark and organizes a co-operative. Every member of the community, white and colored, is included, each having one vote. A board of directors is chosen and a trained manager is hired. The co-operative leases the government cotton gin and borrows \$20,000 for working capital. Farmers now take their cotton to their own gin, and share pro rata the ginning profits. The co-operative will sell their baled cotton and cottonseed as a unit. A special variety of cotton, well suited to this Missouri soil, fetches a higher price. The co-operative starts a store, a blacksmith shop, and a sire service to improve the livestock population. In its second year the co-operative pays back \$3,500 in profits to members, after setting aside a reserve and making an extra year's payment on its government loan.

Responsibility is now coming down on La Forge. Will members stick by their co-operative? Will the directors run it effectively? The co-operative idea spreads to a medical care program which ninety-four families join. It spreads to a veterinary service, a community library, a night school for Negro adults; into church work, knitting clubs, soft-

Men at Work

ball clubs, 4-H clubs, home economics demonstrations. These are the people who had been written off the books as shiftless and "no 'count," destined to exist on relief, half dead, half alive, for the rest of their mortal span.

Think of it, 100 families with no pattern of working together, 100 separate, aimless, rootless units, forging a new social organism, where everyone makes his contribution and has his place. In the early meetings members were quiet, hardly daring to speak. But they were urged to express their ideas and their neighbors listened. They became aware of untapped resources within themselves. They found they could actually help to run a commercial enterprise like a cotton gin or a general store. They were obeying the first principle of education—learning by doing. Some grumbled, some refused to patronize the store, some wondered if they couldn't make a better deal for their cotton at another gin. But most of them stuck. Said one Negro farmer after a year: "I ain't a nigger, I'se colored folks."

ACCOUNTS

Every family must keep a budget. It is one of the first things the children learn to do in school. Let us look at a typical one. Total income is \$1,277. AAA payments account for \$300. While most of the rest is from cotton, these people no longer live or die by cotton. They are raising and selling livestock, eggs, soybeans, lespedeza, milk.

Total outgo is \$933, of which \$515 goes for rent and repayment of FSA equipment loans. The rest is for farm expenses, repairs, medical and veterinary fees.

From the Lower Depths

So the average family has a cash balance of \$344 available for clothes and other things. After the REA brought them current, some families began to buy radios, electric irons, washing machines, refrigerators. In addition, the family inventory of livestock increases every year, as calves, pigs, goats, chickens, geese, turkeys, multiply. At the start the 100 families had an average of \$28 worth of personal property, including cash. At the end of two years they had \$1,440 worth.

Here are Mr. and Mrs. Alvin Compton. In 1937 they had \$10 worth of household goods and a battered jalopy in which they groped around for work as farm laborers. The most either of them ever earned was \$2 a day picking cotton; the worst, thirty-five cents a day chopping it. They called their shack The Frigidaire. If they saw \$75 cash in a year, they felt rich. By 1941 they had a fine farm, electricity, two cows, three goats, twenty-seven pigs, two calves, a team of mules, and \$600 clear. Instead of fat back and corn bread they ate milk, butter, eggs, potatoes, pork, chicken, and a dozen kinds of vegetables. Mrs. Compton, who weighed 102 pounds in 1937, tipped the scales at 121.

But were these human values won at a financial loss to the rest of us? They were not. Here are some figures:

GOVERNMENT INVESTMENT

Lands and buildings for farms	\$599,530
Land and improvement leased to Co-op Association	35,529
Equipment loans to farmers	131,454
Operating loan to Co-op Association	19,930
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Direct government investment	\$786,443

Men at Work

RETURNS ON THIS INVESTMENT, THREE YEARS TO JANUARY 1, 1941

Repayments of equipment loans, including interest	\$ 61,682
Repayment of Co-op loan, including interest	5,597
Farm rentals received	64,661
Rent of Co-op property	10,608
	<hr/>
Total cash return	\$142,548

The investment total does not include FSA overhead, some WPA road labor, or the technical services of certain co-operating organizations like the NYA. A substantial fraction of the rent had to be allocated to maintenance and depreciation of the buildings and the gin. But this is a financial statement to please any landowner, any taxpayer. It is primarily a peacetime record, as the whole La Forge project was a depression undertaking. Like the town planners of Elma, Washington, whom we shall meet later, the FSA worked out a method that can help us ward off another depression, if the postwar period brings the expected slump in farm markets.

Farm subsidies toward the end of the depression were costing taxpayers upwards of a billion dollars a year, without much of it coming back. If La Forge were the nationwide farm relief pattern, taxpayers need not be out a cent in the long run. Even if such projects did not pay out to the penny, they would enormously reduce the dead weight of relief. Baasch believes that La Forge methods could be widely applied in areas where family-sized farms make economic sense. The Government, however, should retain control of the land use, if not the legal title. Otherwise land speculation might ruin everything.

From the Lower Depths

PEOPLE CALLED NO-ACCOUNT

A good many learned philosophers have said that democracy is impossible because most people are stupid, shiftless, and incapable of self-government. You would be surprised at the number of prominent Americans who believe this, but say it only after about four highballs.

Can people at the bottom of the economic scale, people called no-account, lazy, degraded, grasp an opportunity when a real one is offered, and rise out of their misery? This is the acid test. If they can, democracy is proven; if they cannot, we had better turn things over to the elite and be done with sentimental pretenses.

You could not ask for a better collection of undernourished, shiftless illiterates than the La Forge tenants appeared to be when this experiment started. When I saw them they were working hard, their health was greatly improved, their skills had expanded; they looked and talked like responsible, upstanding, taxpaying citizens. Only two families had fallen by the wayside. There were 10,000 families on the waiting list.

Ten thousand families needing such a chance, near enough to know about La Forge, waiting patiently for someone to drop out. . . . The war has overrun the project as it has so many other things, and for the moment there is no waiting line.

I submit that this project is one of the most important demonstrations of democracy ever made. It gives the lie to those who hold that the mass of the people are imprisoned in their shiftlessness from the germ plasm. It makes it impossible for an intelligent, well-informed person ever

Men at Work

again seriously to contend that most people are incapable of self-improvement. It has demonstrated by controlled experiment what capacities lie buried in our fellow-citizens, ready to come out if they are given a chance.

Democracy, as has been said of Christianity, has never really been tried. In the La Forge experiment we can catch a glimpse of the violently exciting future which awaits us when it is tried.

When Hans Baasch left La Forge, he gave a farewell talk. Sarah Harris, wife of the preacher, replied: "We need to take hold of the hands that are reached down to us, so that we can reach down and take our children's hands and lift them up."

10

HOW TO KEEP GHOSTS OUT OF TOWN

A Plan for Elma, Washington

WHAT is a ghost town? One where there used to be a way to make a living, and the way has somehow disappeared.

From time to time America has been spotted with ghost towns, as their enterprising citizens have used up some gift of nature that had provided a resource base—forests, fisheries, grasslands, minerals, oil, or water table. Sometimes a whole industry picks up and moves, leaving half the stores vacant along Main Street. Thus certain New England towns have seen their cotton mills move south, or their shoe factories move west. In general, a large, highly specialized, and rapidly developed community tends to be vulnerable and unstable. The power age can make ghost towns very rapidly.

The Government has recently listed scores of communities which have developed acute gigantism because of war

Men at Work

orders. People have been rushing to Detroit, Seattle, San Diego, the way they rushed to California in '49, lured not by bright stones in Sutter's Creek, but by \$79.50 a week at United Aircraft.

What is going to happen to these towns when the pay lode runs out? What can a threatened town do about its ghosts? Well, one way is to do what a certain western town did shortly before the war. Ghosts were beginning to threaten this town, and it fought them off. Its resource base was almost gone. So the people got together to see what they could do about finding another base. It was their town. They liked it. They wanted to go on living there. How they managed to is more than an interesting story. It is a demonstration that can be applied to many other places. In a way, they worked out a new social invention.

TIMBER!

Ed Stamper of Elma, Washington, had a Douglas fir in his back yard. It was one of the 200-foot giants which covered the Olympic peninsula like an army. Nobody ever counted or could count the Douglas fir trees. They were synonymous with infinity. Ed ran his thumb over the edge of his ax and started swinging. He spent a good many man-hours working up this fir tree, but the hours were not wasted. He built himself a frame house, a shed-kitchen, and a woodshed out of part of it. He hewed out 300 fence rails, ten feet long, from some of it. He made 334 railroad ties from some more of it, and sold them. He split out 500 boards six inches wide and two inches thick. He piled up fifteen cords of firewood in his new wood-

To Keep Ghosts Out

shed. He sold the bark for \$12. And still he had a lot of tree left.

All this was reported in the *Elma Chronicle*, and the year was 1889. In that year there were roughly estimated to be six billion board feet of uncut timber in the Elma region—Douglas fir, hemlock, cedar, spruce. The forests covered 153,000 acres, with only small clearings here and there, and ran like a deep, green sea down to the little town. The first settlers, who were farmers, fought the trees as they would an enemy. Not many were as thrifty as Mr. Stamper. They hacked and burned and slashed them.

The first sawmill began to hum in 1890, cutting up logs which ox-teams dragged in. A decade later the big companies were established, with "high-line" logging, narrow gauge railroads running far up into the hills, and absentee ownership, all complete. Ten big mills were ripping and screeching. A magnificent technique was being worked out for snaking 200-foot Douglas firs out of the woods and tearing them apart. The new method beat Ed Stamper's ax about 1,000 to one.

But the big outfits cut ruthlessly, taking the finest trees and letting the rest be destroyed. What was not broken was burned. Why not; wasn't the forest "inexhaustible," as everyone said?

For fifty years the cry of "Timber!" was this town's theme song. Children, almost before they could walk, knew the crash of lordly firs, the screech of donkey engines, the hum of saw mills, the clean aromatic smell of sawdust, the endless procession of logs to the mills and planks to the market. Men settled there and raised their families. Most of the farmers were only on part time, getting the bulk of their income from the woods. The rough

Men at Work

pioneer camp gradually grew into a well-ordered community, as confident of its stability and its future as Seattle or Spokane. By 1910, timber stands in the Elma area were 38 per cent gone. A schoolboy could have drawn a chart and foretold the year the ghosts would come. But neither boy nor man did so until 1938.

THE DAY OF RECKONING

In that year the ghosts were ready to close in. Of the 153,000 acres of towering virgin forest, only 11,000 remained. Inexhaustibility was down to 7 per cent. The Malone mills, which provided the livelihood of more than one-third of Elma's population, closed down, dismantled their machinery, and moved away. Seven per cent is only 7 per cent, and the day of reckoning had come. When would the surviving mill go, and what would people do then? More than a thousand jobs were dependent on the dwindling forest, 60 per cent of all the jobs in town. Citizens looked over the pleasant valley where the town lay, to the gutted hills beyond, crest on crest of denuded, devastated slopes, thousands of acres where fires had swept, bare even of second growth.

The West was pockmarked with mining towns where the roof of the Opera House had fallen in, and lumber towns where no more donkey engines screeched, but only owls. Was Elma too to become just a memory? Six thousand men, women, and children, good Americans, lived in the region. Two-thirds of them owned their homes. What were they to do?

The Elma Community Chamber of Commerce called a meeting of leading citizens, who represented the central

To Keep Ghosts Out

town and the surrounding villages for which it was the trade center. They decided to appeal to the State Planning Council of Washington. That was what the Council was for. It had no tame industries it could ship to Elma to save the day, but it had some brains to spare. The Council knew that a failing timber supply was likely to create ghost towns all over western Washington. Here was an opportunity to set a precedent and work out a technique for reviving them.

Had the people of Elma ever studied the needs of their town; their natural resources; their economic habits; their standard of living; their way of life? Did they know their soil types and the best crops for them? Did they know what the forest situation really was for the long swing? How about mineral deposits, water resources, recreation possibilities, fish and game? How about the schools, the public services, medical care?

No, the people of Elma had little definite knowledge about these things. They had accepted each situation ready-made without studying it. "Why not take an inventory?" asked the Council. The first move in the campaign was to make an honest survey of the town's material and human resources.

The townspeople agreed and asked whether the Council could help with the survey. It would be glad to help. Further, it would contribute a trained director, suggest research workers, and mobilize the various federal, state, county, and private agencies which already had information about Elma in their files. It would enlist the support of experts from the two universities of the State. But if the survey were to be worth a hoot, said the Council, the bulk of the work must be done on a voluntary basis by

Men at Work

citizens themselves. *If Elma was to be saved, the people themselves had to save it.*

Up to the depression of 1929, Elma had been full of optimism, growing and expecting to go on growing indefinitely. As the trees came down, people's spirits went up. The only possible survey at that time would have been a booster job which exaggerated assets and kept a demure silence about liabilities.

This 1940 survey was a different kettle of fish. It must tell the *whole* story, not just the sweet parts. It was not to be carried out by a high-priced public relations firm anxious to please its customers. No. It was too late for elegant brochures in four colors. This must be a grass-roots survey, carried out by the people.

A local committee of 21 was organized, with a steering group of three members, to carry out the Council's suggestions.

STUDENTS TO THE RESCUE

The survey took about a year. Its uniqueness lies not only in the findings of fact and the remedies proposed, interesting as these are, but even more in the experiment with grass-roots co-operation. The closing of the Malone mill had really frightened people. So when the Committee of 21, composed of leaders whom they trusted, asked for help, the people responded. Almost 80 per cent of families handed in the detailed, confidential questionnaire which formed the heart of the study of human resources. People bared their income and property secrets. The high rate of return was due to the feeling that the questionnaire was their own project, not that of some smart aleck poking into their business.

To Keep Ghosts Out

The superintendent of schools and the teachers pitched in and began to try to interest their students. You know how young Americans were in 1940—interested in very little. Yet in no time at all, these teachers had a roaring fire going. “Young people are far more alert to local problems than is generally recognized.” In many cases they became so aroused that they lighted up parents who had been apathetic. The Council regards this awakening of the youngsters as the *highlight of the whole survey*.

One group of 120 high school students were specially trained for placing the questionnaire and helping people answer it, when help was wanted. Some of the questions were pretty technical. The youngsters had to cover by car, bicycle, or on foot, an area of 250 square miles, and deliver the four-page document to 1,600 families. Answers were collected unsigned, in sealed ballot boxes, and delivered for tabulation on Hollerith machines. The State Department of Unemployment Compensation and Placement operated the machines.

Another group of students were trained by their civics teacher to make a land-use survey covering the area. Data were placed on a large base map. Youngsters who worked on it began to know their town as no pioneer, no parent, no policeman had ever done. The map and the questionnaires became original source material of the greatest importance for the survey. The young people were in on the ground floor.

JIGSAW DATA

Besides the original source material there was, of course, a lot of information about Elma already in print. But it was scattered in census reports, forest service findings, state

Men at Work

documents, county agents' records, rainfall readings, flood records—all over the place. Here the Council was able to furnish invaluable help, by getting together all published information about the region, fitting the jigsaw pieces into a comprehensive pattern, and determining what parts were missing. There was no adequate record, for instance, of the area's soils.

The Council, in effect, acted as a clearinghouse for no fewer than forty federal, state, local, and private agencies, every one of which knew something important about Elma. Here, says the Council, is the second highlight of the survey—the vast amount of useful material available to any town in the country, *if somebody rounds it up*. Citizens wanted it, and the Council got it. Among others, this information came from:

U. S. Forest Service	University of Washington
U. S. Soil Conservation Service	Washington State Department of Conservation
National Park Service	Washington State Board of Education
National Resources Planning Board	County Agricultural Agent
U. S. Geological Survey	County Welfare Department
Northwestern Regional Council	Elma Chamber of Commerce
Washington State College	Elma municipal officials
	Local business firms

As the gaps showed up, the co-operating agencies strove to fill them, by bringing their information up to date, or by making new studies. The geology of the region was reviewed by the State Department of Conservation and checked by field work. So was data about stream flow, rainfall, flood control. The U. S. Soil Conservation Service, with the co-operation of farm owners, made a soil

To Keep Ghosts Out

map, in which it appeared that many Elma farmers were trying to grow crops on barren ground, while some excellent soils were being neglected. The County Agricultural Agent made a study of the butterfat production of Elma herds which brought to light a miserable record. The school system had an intensive going-over by the State Board of Education. . . . And so it went. The results are all set forth in the Survey Report, bound in green, with a land use map of Elma on the cover. The date is 1941.

BACK TO THE WOODS

By 1938, according to the Survey, the six billion board feet of lumber in the area had been slashed down to 500 million. Of the old timber lands, 72,000 acres were in relatively poor second growth, largely uncared for; 40,000 acres, one quarter of the whole forest area, were *dead lands*, so badly burned that nothing useful was growing on them at all. Under current conditions of exploitation, waste was prodigious, and many valuable by-products were thrown away.

In this forest report came the most significant economic fact of all for the future of Elma. Four-fifths of the whole area of 250 square miles was planned by nature for big trees. The soil, the rainfall, the topography demanded them. Soils for farming were limited, new large industries highly improbable. "*Basically Elma will always be a forest region.*" The main resource base could not be changed; it could only be renewed and strengthened. The forest had to be nursed back if Elma were to survive with its present population.

By wiser treatment the forest area could be made to

Men at Work

yield far more for the support of the people than it had been giving, and yield it forever. The survey reports that the remaining forest can produce four times as much by better management, on a sustained or perpetual yield basis. Sustained yield means that the annual growth keeps level with the annual cut. As Elma has no mineral deposits of much commercial value, and no outstanding hydroelectric power sites, its industries in the future must chiefly process lumber. Ed Stamper, back in 1889, had the right idea—use the whole tree.

FARMS

Only one-fifth of the area was suitable for farming. Farmers came to Elma ahead of the loggers, but they cannot take over the town again, because God didn't make it a farming town. But farmers can make a larger contribution to the town's economy, by improving their herds, their equipment, their interest in farming; by irrigation in the dry summer months; and especially by growing crops fitted to the natural soils. Too many families had looked on farming as a left-hand occupation. Now they must look at it straight, and use the admirable techniques which the forty agencies have to offer! If they do look at it straight, there is an excellent chance that farmers can double their income from the land.

It cannot be done, however, on the basis of each man for himself. There must be co-operation in both production and marketing. Take strawberries, a specialty crop of which citizens are proud. A small farmer cannot get anywhere raising strawberries alone. Too many have tried it and failed. But a co-operative, with pick-up truck service,

To Keep Ghosts Out

grading standards, perhaps a cannery, established markets in Tacoma and Seattle, technical aid in the care and feeding of the pesky plant, might work wonders. Co-operatives could be useful too in marketing poultry, beef, Christmas trees, cascara bark, all sorts of things.

Another strong recommendation of the survey was to make Elma a recreation center for fishing, hunting, boating, swimming, hiking, motoring. Its natural scenery is magnificent—at least where the dead lands do not show. It is only a few miles from the Pacific. In Maine, when the lumber barons got through, the tourists moved in. It is interesting to see a similar movement beginning on the other side of the continent. "The Elma area is just one of the many regions which is moving over from the extractive economy of youth to the husbanding economy of mature years."

What did the questionnaire show the people wanted? Those in the mill villages mostly wanted to get out of them. Half of those living in the town of Elma wanted to get on a farm or into a garden home. "The small, part-time farm, with all its shortcomings, seems to satisfy rural citizens and to hold attraction for townspeople." These wants are strictly on the U. S. trend curve. As a nation we are headed for decentralization, where the blight and congestion of Megalopolis are relieved by country homes, and industrial and clerical workers run a "twilight farm." Henry Ford and others have set a far-reaching pattern.

But, says the survey, if the people of Elma want this pattern, they must plan for it. They must help to keep the mills going by improved forestry, on the one hand, and tighten up their agricultural practices, on the other. They must beware of scattering up the creeks in remote hill

Men at Work

bungalows, at a fantastic cost for roads, schools, water, power, and other utilities. Far better to scatter into a "garden city" development—one planned for living, not for speculative profit.

TACTICS AND RESULTS

I have only hinted at the fact-finding and the recommendations which the survey contains. But perhaps enough has been given to show the strategy and tactics. These can be applied to any town that is haunted or threatened with ghosts. Here they are:

Get the people interested.

Find out all the facts, good and bad.

Obtain the co-operation of all interested agencies, federal, state, local, both government and private.

Put the youngsters to work.

Retain a competent manager to direct the survey as a whole, and a few good research workers to prepare and tabulate family questionnaires, market studies, levels-of-living studies.

Get the report to everybody in town and get them talking about it.

Then encourage them to line up behind a committee to put the recommendations into effect.

How far did Elma go with this last step? It was making good progress when the war turned the whole picture temporarily to the wall. A rich new resource base appeared, in government orders for ships and planes in Seattle and Portland. So long as the Pacific war lasts, Elma

To Keep Ghosts Out

will not need to worry much about her immediate economic situation.

Perhaps the most important action resulting from the published survey was its introduction into the school curriculum. The children began to use it as a textbook. Gradually it became a kind of springboard for plunging into the history, economics, geography of their nation, their continent, and their world. It is the youngsters, moreover, who will save Elma. What better preparation could they have for the task?

The high school proceeded to acquire a 250-acre school forest. There the boys were given practical training which they can use on their own home wood lots as well as in the lumber industry. In 1941 they planted 5,000 trees, including 2,000 cascaras, whose bark is a valuable drug. Meanwhile, the CCC camps in the area were encouraged to plant twenty-five million seedlings.

The Weyerhaeuser Timber Company, in co-operation with one of the leaders of the survey, established a 120,000-acre tree farm, to be restocked and protected against fire until it can be cropped for a perpetual yield. Seventy local men and boys were employed here. Another logging company purchased adjoining timber lands to form one large block, again for perpetual yield. The State Division of Forestry replanted that part of the Capitol Forest which extends into the Elma area, on a similar basis.

Farmers and small wood lot owners formed a co-operative for marketing their wood products. They hired a trained forester to show them how to thin their trees and grade their poles, piling, pulpwood, for the best market price. A special Forest Development Council plans to have

Men at Work

warehouses and small factories established, to reduce still further the waste of "small stuff."

Average butterfat production per cow was studied and increased as a result of the work of the Dairy Herd Improvement Association. Another co-operative was formed to clear cut-over land where the Soil Conservation Service pronounced the soil good for crops. The great Wenzell Slough was drained, and more excellent farm-land brought in. Experiments were started for raising beef cattle on certain cut-over lands, for producing tulip bulbs, for mapping local trails and fishing holes for tourists. A co-operative was projected for marketing wild berries, and a furniture factory to use local alder wood.

The satellite village of McCleary, population 1,150, has been incorporated as a "city," with community organizations and a plan for independent development. The Simpson Logging Company, which bought a run-down mill and holdings, is co-operating fully and wage rates have risen markedly. In McCleary, as in Elma, the improvement in physical appearance of the town is matched by the heightened morale of the people.

"For the first time citizens of Elma have been united in one large enterprise," says Ben Kizer, chairman of the State Planning Council. "They have co-operatively made the survey; now they must live it."

Will they? I cannot answer that one. They were certainly trying to, when the war intervened. But I can answer this one: What is the best way, and the most democratic way, to keep ghosts out of any town? The answer is: Get a copy of the Elma Survey, study it prayerfully; go thou and do likewise!

The people of Elma were starting to create *new* fron-

To Keep Ghosts Out

tiers. The traditional pioneer packed his family and the cookstove into the wagon and moved on, when the forests or the grasslands or the soils had had the life beaten out of them. The people of Elma do not propose to move on. They propose to stay in the homes they love, and instead of practicing assault and battery on Nature, to work with her.

11

WHAT THE TVA MEANS

Planning at the Grass-Roots

GUNTERSVILLE was a nice old southern town on the Tennessee River where it makes a big bend into Alabama. The TVA plan for the river called for a mainstream dam a few miles below the town. When the water backed up, it would engulf a considerable part of Guntersville. Nobody likes to be drowned out, and the city fathers were in despair. They petitioned the TVA to buy up the part of the town which was on high ground and end its corporate existence.

The TVA people didn't say yes and they didn't say no. They asked the city fathers to look at a map, some sketches, and a rough plan. The sketches showed a new town on a peninsula, with a broad expanse of water on three sides. What a fine fishing, boating, and recreation center it would make! It could continue to be the county seat, of course, and there would be new revenue from the navigation terminal which was part of the whole river development program.

What the TVA Means

The TVA men laid the papers in front of the city fathers and walked away. They were not going to tell them what to do; they were just going to open a window and let the city fathers look out of it. The more the fathers looked, the more the prospect pleased them. The maps indicated that it was mostly the poorer, river bottom sections which were going under water. They had never been much to look at anyway, nor much to get taxes from. The city government withdrew its petition and decided not to abandon Guntersville. A local planning board was organized to co-operate with the TVA in developing the new town. The whole population grew interested and began forming citizens' committees to pitch in and help.

There she stands today, pretty as a picture, queen of a great inland sea, cool breezes blowing even in the hot Alabama summers. Shortly after the reservoir filled up, the town arranged a series of motorboat races. Provision was made for 10,000 spectators. When the great day arrived, 50,000 showed up. They ate up everything in the town by noon. A recreation center indeed!

BUILDERS

The story of Guntersville illustrates the temper of the men who work for TVA, and the new spirit of the valley residents. The men are not so much smarter or wiser than the rest of us, but they seem to have got hold of something they believe in. Most people want to build things, make things they can be proud of. Shattering sales resistance is neither a very lofty nor a very permanent career. In the men of the TVA you feel coming to life again the spirit of New England craftsmen building houses,

Men at Work

churches, and clipper ships—the spirit, it seems to me, in which the Republic itself was founded. As these men talk to you and show you their dams and their contoured fields, you begin to see what America might be if all Americans really believed in what they were doing.

Back of the integrity of the men stands the integrity of the engineering. A mighty river in floodtime is not something one can stop by making a speech. It takes quiet, hard-thinking men, versed in geology, physics, and mathematics, to design a dam which will shoulder its way into the rock of the hills and stand there as long as the hills stand. It takes sure-handed, disciplined men to build what has been designed.

The Tennessee Valley Authority has tamed a river which, with its four main tributaries, flows through seven southeastern states. One never visits TVA headquarters without running into Russians, Czechs, Chinese, or South Americans, who have been sent to study this unprecedented experiment in regional planning. Rivers have been dammed for power, diked against floods, dredged for navigation. Such operations are nothing new. But here we have a great region, larger than England, planned for and developed as a single organism. Nothing like this has ever happened to any other river in the world. Nor have any valley-dwellers in the world experienced the social planning that has happened here.

The sheer engineering size of the TVA, with its twenty-nine dams (sixteen of them newly constructed), its 10 billion kilowatts of energy a year, its 250 million ton-miles of river traffic, its 3 million acres of co-operating farms, is arresting. The construction is on a monumental scale, with every dam presenting a special problem. At Watts

What the TVA Means

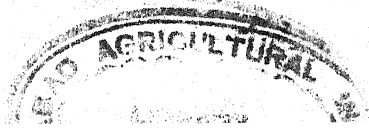
Bar, for instance, where the north bank of the Tennessee rises in a hundred-foot cliff, it was necessary to build the tallest lock-gate in the world. Watts Bar has a control tower crowning the cliff, and a model town for the maintenance crew. Every detail of this stirring exhibit has had bold and original architectural treatment, for which Roland Wank is chiefly responsible.

There are two kinds of dams: mainstream dams, which are generally long and low, with locks to permit navigation; storage dams in the headwaters where there is no navigation. Both produce power.

I watched the builders at work on Fontana, largest of the storage dams. The site is a wooded ravine where the Little Tennessee comes roaring out of the Great Smoky Mountains. On the crisp November day when I visited it, the dam was about half finished, a mass of cement fringed with wooden scaffolding. The river still flowed, but in diversion tunnels instead of its own bed.

Just below one of the tunnels a whole section of mountain was soon to come down in the greatest quarry shot ever fired. You could see the drilling machines on the crest of the cliff against the blue sky, their walking beams clanking up and down. They were sinking holes 300 feet deep, to be packed with a new type of explosive, violent as TNT but safer to handle.

Berlin, Hamburg, London, never received such a shock as this mountain will receive. The "aggregate" will come down by the tens of thousands of tons. Then, unlike the rubble left by blockbusters, it will go up again. That big conveyor belt across the river will take it into the crushing mill, and the next conveyor above will take it on to the mixing plant on the side of the mountain. With ce-



Men at Work

ment and water added, it will be poured on the top of the dam by a T-crane, big as a skyscraper. More layers will be poured on until the face of the dam stands more than 500 feet above the river and reaches to the scarred line under the pines. The mountain comes down, yes, but only to be reshaped and rise again in a massive wall, holding back tens of thousands of kilowatts of energy.

Twenty-nine dams control literally every gallon of water which comes down the Valley. At the central control room, engineers can direct the flow of the whole river, build up storage at one point, increase power at another, flood out mosquito larvae by raising the level of one of the reservoirs an inch or two, deepen the navigation channel at another point, hold back a flood.

FARMERS

All this tremendous engineering would become useless, however, if farmers' fields should continue to erode, filling reservoirs and navigation channels with silt. Seven million out of the 8,000,000 farm acres in the Valley had been hurt by erosion in the past, some of them beyond repair. The TVA men know how to stop erosion, how to use the new phosphate fertilizers which they have developed to bring back the land, how to replace soil mining with a permanent agriculture. They know how to plan with nature and go forward—not backward, as the Valley had been going for a hundred years. As their methods gain the landscape is being transformed.

How was it done? It was not something engineers could do alone, for it was done on the land of farmers noted for their bitter sense of property. It was done by a slow,

What the TVA Means

gradual process of education, and voluntary acceptance of new methods by farmer Clark.

The TVA men would hold a meeting in the back country, explaining with charts, movies, photographs, how the land was running down the river, and how erosion could be stopped. They explained how to rotate crops, how to bring back the grass and the pines, how to make the farms more productive and self-sufficient. On the law of probability, one or two farmers would be impressed; the others would scratch their heads, switch their plugs to the other cheek, and file silently out of the meeting. It was too new-fangled for them. But farmer Clark, looking rather frightened, would sign up.

For a year, two years, the others would watch farmer Clark running his terracer, planting his pines, healing his gulleys with lespedeza grass. Then would come the critical test, so essential to grass-roots planning. The farmers looked; they saw the land returning to vitality; they noted the greater crop yields, the heifer on the grass, and milk for children who had never known cow's milk. Of their own free will, like the city fathers of Guntersville, they would sign a contract with the TVA for soil improvement. Henceforth they would work their land as farmer Clark worked his.

David Lilienthal tells of a meeting in northern Alabama where 300 farmers from eight different counties drove their cars in to Aaron Fleming's place to see what he had done as a co-operator. They were so impressed that they went home and started similar practices on 150,000 acres of land!

Now, from an airplane, the beautiful contoured slopes swirl all over the Valley. Every plowed contour is the

Men at Work

result of an individual farmer's personal decision after observation and conviction.

LITTLE MEN GROW BIGGER

Unless the people of the Valley are behind the TVA, it becomes just another big power grid, operated by remote control from Washington instead of Wall Street. Unless the people realize it is their agency, working for them, it has no permanent function. On the other hand, the Valley people have been living for generations in a corn and cotton culture, which has narrowed their horizon and slowly impoverished them through declining fertility. Their imaginations too have been impoverished. Their more enterprising children have got out to the big cities of the North at the first opportunity. So it has been hard for the people to get a fresh perspective and see what their Valley might be, easy for them to resent any change in their accustomed ways.

The TVA men—trained in geology, ecology, economics, agriculture, engineering—have the perspective and can see the possibilities. Here is energy unlimited in the great river. Here is a new lake system 600 miles long, with many potential uses in a happier way of living. Here is diversified farming to replace the one-crop pattern, with cotton up to the front door. The problem is to light the imagination of the people, and then let them go forward under their own power. A dictator with a good technical staff could enforce progress, could threaten to shoot the burghers of Guntersville if they left the town. But such progress, besides contradicting every tradition in this country, would cost too much and would presently defeat itself.

What the TVA Means

The progress that sticks is the kind that the people themselves freely help to make. Again and again the TVA administration has seen clearly what to do and has had the legal power to do it. But it has waited until the people caught the idea and started to do it themselves. Here in the Valley a way is being evolved to reconcile planning with people. When the people do feel that the TVA belongs to them, they get behind it voluntarily and freely, to build new towns like Guntersville, sign the soil erosion contracts, develop new industries and new opportunities for employment.

As the *Daily* of Decatur, Alabama, puts it: "We can write of great dams. Yet the significant advance has been in the thinking of a people. They are no longer afraid. They have caught the vision of their own powers. They can stand now and talk out in meeting and say that, if industry doesn't come into the Valley from other sections, then we'll build our own industry. This they are doing today." Or as Robert Duffus wrote in the book he did with Charles Krutch: "All over the valley little men have been growing into bigger men because they have had bigger things to do."

Every major project is placed before the people of the Valley, to obtain their advice and co-operation. Washington, although it could legally close up the whole enterprise, cannot dictate policy. Decisions are made in the Valley. So far, despite efforts by local politicians and outcries from senators and congressmen, not a single political appointment has been made, or a single project undertaken for personal political advantage.

Low cost energy is available for industry, farms, and homes. So is low cost water transportation. In addition,

Men at Work

TVA develops new mineral deposits, expands highways, trails, recreation centers, tourist traffic. It works out improved farm implements, such as portable irrigation units, a portable thresher, food dehydrators, a low-cost electrical hay drier. It controls stream pollution and maintains a public health program, beginning with a campaign to eradicate malaria. It makes studies in co-operative organization, rural electrification, urban planning, as in Gunter'sville. It carries on extensive and enlightened resettlement projects for people flooded out in the new reservoirs.

Its grass-roots planning is well illustrated by the following local bodies with which it actively co-operates:

The state governments of Tennessee, Alabama, Georgia, Kentucky, North Carolina, South Carolina, Virginia—all of which lie within, or partly in, the watershed. The co-operation is with state departments of agriculture, engineering, forestry, health, conservation, education, recreation, geology.

The cities and towns in the Valley, nearly all of which buy TVA power.

The county governments and county soil conservation associations.

The farmers' co-operative associations which buy TVA power.

The Tennessee Valley Trades and Labor Council, the central body for all the labor unions of the Valley.

The land grant colleges and state universities—which do much research work for the TVA.

Farmers' voluntary soil conservation projects, local recreation groups, the Waterways Conference, the private utilities, local community planning groups, the farm organizations.

In 1942 there were 40,000 people working for the TVA, most of them construction workers. This was the year when the dam-building program was at its height. The

What the TVA Means

Administration has had astonishingly successful contracts with the labor unions whose members build the dams. There are joint labor-management committees, an annual wage conference, freedom for employees to join or not join unions (about 90 per cent do), a five-day and forty-hour week in peacetime. There are efficient apprentice training systems, and a superlative safety program, in which management and men have achieved world's records in dam-building.

Workers' housing has been carefully planned, with model construction camps, and frame dormitories for single employees. There are arrangements for permanent work as men move from one dam site to another—a condition hitherto unknown on construction jobs like this. Workmen on commercial projects usually have to live in tar-paper shacks, but not in the TVA. The new town of Fontana, which we glanced at on our visit to the dam, seemed to be designed as carefully as the dam itself. This village, population 3,000, contains schools, playgrounds, a hospital, a theater, stores, and other permanent buildings, well spaced and attractive. In addition, it contains 200 trim, prefabricated, demountable houses which can be trucked from one engineering job to the next. The community is so designed that it will not automatically become a ghost town when the dam is finished, but will shrink to the smaller size needed by the maintenance men and their families. If it should later become a mountain resort and recreation center, which is not impossible, it could expand again.

At this point practical men may pull long faces about the cost of making living conditions tolerable and even pleasant for people who tear down mountains and build

Men at Work

great dams. There are several answers. One is that the morale and the energy conserved, plus the low accident, sickness, and turnover rates, all are money-savers. Practical men will find the final construction costs, per cubic yard of concrete poured, as low as they come. Another answer is that revenues are increasing. For the last two fiscal years TVA has asked for no appropriations and has a surplus. Yet its power rates are as low as anywhere in the world. The rates are computed without a charge for interest, but with a full allowance for taxes.

AN MVA

Other regions are planning for river development, using TVA as a model. Both the *St. Louis Globe Democrat* and *Post Dispatch* are conducting rousing campaigns for a Missouri Valley Authority, following the terrible spring flood of 1944. The Mississippi, when I happened to cross it during that flood, was a great, rolling, yellow sea. It spread for miles, filled with tree trunks, barn roofs, wreckage—the highest level on the flood gauge for 100 years. The city water front was submerged; factories stood like islands. The Missouri River was chiefly responsible. All the way upstream to the Rocky Mountains the damage was calamitous.

On May 14 the *Post Dispatch* published a full page editorial which deserves to become historic. For days the flood news had crowded war news out of the headlines, and the paper had been filled with stories of loss and disaster. The editorial was entitled: "One River—One Problem." "The time has come," it said, "to recognize that the Missouri River is one big river, presenting one big prob-

What the TVA Means

lem. It is not one thing in Montana, another thing in the Dakotas, a third thing in Kansas, and a fourth in Missouri. It is not primarily an instrument to be used for irrigation, or for navigation, or for power; nor is it primarily an evil force to be controlled against its repeated and disastrous flooding. It is a synthesis of all of these. Where is the plan that will solve one big problem of the one big river?"

The *Post Dispatch* reminded its readers that such a unified plan was not Utopian, because one was already at work in the valley of the Tennessee. Although the Tennessee is not as big or as long as the Missouri, its floods used to be even more devastating. In 1944, however, despite a merciless rainfall, the valley of the Tennessee presented a serene and untroubled picture. The *Post Dispatch* proceeded to throw everything it has—and it has plenty—into a call for a Missouri River Authority, to do for Old Muddy what the TVA has done for the Tennessee. Senator Murray of Montana has introduced a bill to establish an Authority for the Missouri. If it passes, another great region can be integrated and its prosperity increased. Another large group of Americans will be employed at vital and rewarding work when the war is over.

It is clear that free competition is no longer able to provide full employment for modern communities. *Laissez faire* was a technique for a simpler age. It is becoming increasingly clear, especially since the war, that communities must be managed to provide reasonably full employment and economic security. But where *laissez faire* has been displaced by planned economies, we have seen country after country become authoritarian.

Men at Work

A terrible dilemma is thus posed: Shall we have unemployment and economic liberty, or jobs and dictatorship? *The TVA has resolved the dilemma*, at least over a part of the economic front. It has developed a method which reconciles democracy with planning. That is why people come to study it from around the world.

It all comes back to the men who work for the TVA. They want their work to last. But they know that it will last longer if people believe in it too, help to develop it, feel they have a part in it.

Everywhere you go in the Valley you will see the mighty dams and powerhouses, cathedrals for the Age of Energy. Inscribed on each of them in bronze letters you will find the words:

BUILT FOR THE PEOPLE
OF THE UNITED STATES

